

## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.





The United States Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs and marital or familial status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means of communication or program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint, write the Secretary of Agriculture, U. S. Department of Agriculture, Washington, DC 20250, or call (8700) 245-6340 (voice) or (202) 720-1127 (TDD). USDA is an equal employment opportunity employer.



United States  
Department of  
Agriculture

Forest  
Service

Alaska Region

Tongass National Forest  
Stikine Area  
P. O. Box 309  
Petersburg, AK 99833

File Code: 1950

Date: June 30, 1998

Dear Reviewer:

Here is your copy of the Final EIS and Record of Decision for the Crane and Rowan Mountain Timber Sale, Stikine Area, Tongass National Forest. The Record of Decision explains my decision to select Alternative 4, which includes the harvest of 24 million board feet of timber from 297 acres in 17 units and the construction of 8 miles of road. The decision implements Alternative 4 as presented in the Final EIS. Harvest method is clearcuts with retention of legacy trees and a diameter limit prescription that in combination are designed to maintain natural disturbance processes.

The appeal period will begin the day after we publish notice in the Petersburg Pilot, the official newspaper of record for decisions made by the Stikine Area Assistant Forest Supervisor. This date is anticipated to be July 30, 1998. The appeal period will last 45 days. I expect the appeal deadline to fall on September 14, 1998. We will implement the decision no sooner than five working days after the close of the appeal period.

As the Stikine Area Assistant Forest Supervisor, I am responsible for this decision. Please direct any correspondence or request for additional copies to Everett Kissinger, IDT Leader, P.O. Box 309, Petersburg, AK 99833, or call (907) 772-3841.

Sincerely,

CAROL J. JORGENSEN  
Assistant Forest Supervisor

Enclosure





# **Crane and Rowan Mountain Timber Sales**

## **Final Environmental Impact Statement**

**Tongass National Forest – Stikine Area  
USDA Forest Service  
Alaska Region**

**Lead Agency**                      **Tongass National Forest, Stikine Area  
P.O. Box 309  
Petersburg, Alaska 99833**

**Responsible Official**              **Carol J. Jorgensen  
Assistant Forest Supervisor  
Tongass National Forest, Stikine Area**

**For Further Information  
Contact:**                      **Everett Kissinger  
Tongass National Forest, Stikine Area  
P.O. Box 309  
Petersburg, Alaska 99833  
(907)772-3841**

**Abstract:**                      **The Stikine Area of the Tongass National Forest proposes to make approximately 23 million net board feet (MMBF) available for harvest within the Crane and Rowan Mountain Project Area using alternative silvicultural prescriptions. This project would include necessary road construction for the transport of timber. The existing log transfer facility at Rowan Bay would be used for log barging.**



# Contents

<i>Contents.....</i>	<i>i</i>
<b>Chapter 1.....</b>	<b>1-1</b>
Purpose and Need .....	1-1
Introduction.....	1-1
Project Area .....	1-2
Overall Direction for the Project.....	1-2
Purpose and Need .....	1-8
Decision to be Made .....	1-9
Public Involvement.....	1-9
Key Issues.....	1-9
Other Environmental Considerations.....	1-10
Issues Outside the Scope of this Analysis.....	1-11
Federal and State Permits, Licenses, and Certifications .....	1-11
Legislative and Executive Orders Related to This EIS .....	1-12
Availability of the Planning Record.....	1-13
<b>Chapter 2.....</b>	<b>2-1</b>
Alternatives.....	2-1
Introduction.....	2-1
Alternative Development.....	2-1
Alternatives Considered in Detail.....	2-14
Alternative Comparison .....	2-16
Alternatives Dropped From Further Review.....	2-17
Mitigation Measures for the Action Alternatives.....	2-17
Preferred Alternative.....	2-18
Project Implementation .....	2-18
Monitoring .....	2-20
<b>Chapter 3.....</b>	<b>3-1</b>
Setting .....	3-1
Introduction.....	3-1
Habitat Conservation .....	3-5
Introduction.....	3-5
Biological Diversity .....	3-6
Wildlife Habitats.....	3-8
Management Indicator Species .....	3-9
Consistency of Alternatives in Relation to Disturbance Ecology .....	3-17
Effects of Alternatives by Area.....	3-18
Watershed Effects .....	3-31
Introduction.....	3-31
Affected Watersheds .....	3-33
Effects of Alternatives .....	3-36
Summary of Watershed Analyses for Security and Dean Creeks .....	3-40
Timber Economics .....	3-41
Introduction.....	3-41
Mid-Market Analysis.....	3-41
Scenery .....	3-45
Introduction.....	3-45

Desired Future Visual Condition .....	3-46
Adopted Visual Quality Objectives .....	3-47
Visual Priority Travel Routes and Use Areas .....	3-48
Alternatives and Effects .....	3-48
Summary of Environmental Effects .....	3-52
Other Environmental Effects .....	3-55
Recreation .....	3-55
Soils .....	3-55
Caves and Karst .....	3-56
Wetlands .....	3-56
Floodplains .....	3-58
Fisheries .....	3-59
Subsistence .....	3-61
Marine Environment .....	3-67
Summary of Effects .....	3-72
Heritage Resources .....	3-73
Timber Resource .....	3-79
Threatened, Endangered, and Sensitive Plants .....	3-86
<b>Chapter 4</b> .....	<b>4-1</b>
List of Preparers .....	4-1
<b>Chapter 5</b> .....	<b>5-1</b>
Listing of Document Recipients .....	5-1
<b>Chapter 6</b> .....	<b>6-1</b>
Glossary .....	6-1
<b>Chapter 7</b> .....	<b>7-1</b>
Literature Cited .....	7-1
<b>Chapter 8</b> .....	<b>1</b>
Index .....	1
<b>Appendix A</b> .....	<b>1</b>
Unit Plans and Road Management Objectives .....	1
Unit Plan Summaries .....	1
Road Management Objectives .....	4
<b>Appendix B</b> .....	<b>1</b>
Riparian Standards and Guidelines .....	1
<b>Appendix C</b> .....	<b>1</b>
Comments on the Draft EIS .....	1

## List of Figures

<b>Figure 1-1</b> , Project Area Vicinity Map .....	1-3
<b>Figure 1-2</b> Kuiu Island Land Use Designations (LUDs) .....	1-5
<b>Figure 1-3</b> Kuiu Island TLMP Allocations .....	1-6
<b>Figure 2-1</b> Stand Initiation Stage Resulting from Catastrophic Windthrow .....	2-3
<b>Figure 2-2</b> Stem Exclusion Stage .....	2-4
<b>Figure 2-3</b> Understory Reinitiation Stage .....	2-5

<b>Figure 2-4</b> Old Growth Stage.....	2-6
<b>Figure 2-5.</b> Stand Development Stages Following Disturbance. ....	2-7
<b>Figure 2-6</b> Diameter Limit Harvest With Some Larger Leave Trees, Age One Year.....	2-9
<b>Figure 2-7.</b> Low Volume Strata With and Without a Diameter Limit Prescription. ....	2-11
<b>Figure 2-8.</b> Medium Volume Strata With and Without a Diameter Limit Prescription.....	2-12
<b>Figure 2-9.</b> High Volume Strata With and Without a Diameter Limit Prescription.....	2-13
<b>Figure 2-10</b> Alternative 1 (No Action).....	2-23
<b>Figure 2-11</b> Alternative 2 (Proposed Action).....	2-25
<b>Figure 2-12</b> Alternative 3.....	2-27
<b>Figure 2-13</b> Alternative 4 (Preferred) .....	2-29
<b>Figure 2-14</b> Alternative 5.....	2-31
<b>Figure 3-1</b> Deer Winter Habitat .....	3-11
<b>Figure 3-2</b> Project Area Connectivity for Old Growth Habitat Strategy.....	3-29
<b>Figure 3-3</b> Affected Watersheds .....	3-34
<b>Figure 3-4</b> Harvest areas by Volume Strata .....	3-83

## *List of Tables*

<b>Table 2-1.</b> Harvest Units in Alternatives by Prescription (Shading is Helicopter).....	2-15
<b>Table 2-2</b> Alternative Comparison.....	2-16
<b>Table 3-1</b> Effects of Proposed Harvest by Alternative on Productive Old Growth (POG) by Prescription. ....	3-13
<b>Table 3-2</b> Amount POG Remaining by Alternative on Island-wide and Project Area Scale.....	3-14
<b>Table 3-3</b> Deer Habitat Capability in 1954, 1995 and 2030 by Alternative.....	3-14
<b>Table 3-4</b> Summarized effects of Cool Lake Units by Alternative .....	3-19
<b>Table 3-5</b> Summarized Effects of Security Units by Alternative.....	3-20
<b>Table 3-6</b> Summarized Effects of Rowan Mountain Units by Alternative.....	3-22
<b>Table 3-7</b> Summarized Effects of Crane Creek Units by Alternative .....	3-23
<b>Table 3-8</b> Summarized Effects of West Fork Kadake Units by Alternative .....	3-25
<b>Table 3-9</b> Percent of Fine Particles .....	3-33
<b>Table 3-10</b> Affected Watershed Acres and Stream Miles .....	3-35
<b>Table 3-11</b> Proposed Roads by Alternative (Miles).....	3-37
<b>Table 3-12</b> Road Miles and Densities by Alternative (System and Temporary).....	3-38
<b>Table 3-13</b> Proposed Harvest by Alternative (Acres).....	3-39

Table 3-14 Percent of Second Growth less than 30 Years Old (1969-1999) .....	3-39
Table 3-15 Timber Cost and Value Summary.....	3-42
Table 3-16 Adopted Visual Quality Objectives .....	3-47
Table 3-17 Miles of Roads Proposed on Wetlands .....	3-58
Table 3-18 Area Harvested Within 300 Feet of Class I Streams.....	3-60
Table 3-19 Number of Stream Crossings by Alternative .....	3-61
Table 3-20 Deer Demand in Alternative 1 by WAA.....	3-63
Table 3-21 Deer Demand in Alternative 2 by WAA.....	3-65
Table 3-22 Deer Demand in Alternative 3 by WAA.....	3-65
Table 3-23 Deer Demand in Alternative 4 by WAA.....	3-66
Table 3-24 Deer Demand in Alternative 5 by WAA.....	3-66
Table 3-25 Types and Frequencies of Project area Heritage Resource Sites .....	3-74
Table 3-26 Cultural Resource Surveys in the Kuiu Island Project Area .....	3-75
Table 3-27 Cultural Resource Survey Areas and Results.....	3-77
Table 3-28 Acres of Proposed Harvest by Clearcut (cc) and Diameter Limit Cut (dl) .....	3-85

## *List of Citations*

### LITIGATION

AWRTA v. Morrison .....	3-32
-------------------------	------

### SCIENTIFIC LITERATURE

Alaback, 1982.....	2-3, 3-8
Anderson and Potts, 1987.....	3-32
Bartos, 1989 .....	3-33
Berenger and King (1995).....	2-21
Bevenger and King, 1995.....	3-32
Bilby, 1985 .....	3-32
Bormann, 1995.....	3-39
Burroughs and King, 1989.....	3-32
Campbell, 1979 .....	3-16
Cheng, 1990 .....	3-33
Cooper, 1965 .....	3-32
Daykin, 1965 .....	3-32
Freese and O'Clair 1984 .....	3-68
Freese, 1987 .....	3-68
Harris, 1989 .....	2-2
Hunter, 1990.....	3-6
Kramer 1997, Harris 1989.....	2-2
Kramer, 1997.....	2-8, 3-2, 3-3, 3-9, 3-17, 3-19, 3-20, 3-22, 3-24, 3-25, 3-60
McCorison et. al, 1989 .....	3-36
Meslow et. al., 1981 .....	3-16

## Contents

Nowacki and Kramer, 1997 -----	2-2, 2-8, 2-10, 3-17
O'Clair and Freese 1984 -----	3-68
Oliver and Larson, 1996 -----	2-2, 2-6, 3-8, 3-9
Oliver, 1995 -----	2-6
Pickett and White, 1985-----	1-1
Pojar and Mackinnon, 1994 -----	2-10
Reiser and Bjornn, 1979 -----	3-32
Schultz and Berg, 1976 -----	3-69
Sealaska Corporation 1975 -----	3-74
Sedell and Duval, 1985 -----	3-68
Sheridan, et al 1984 -----	3-32
Smith, 1962-----	3-17
Soutiere, 1979 -----	3-16
Spencer, 1987 -----	3-16
Swanston and Marion, 1991-----	3-32
Thomas et al., 1990-----	3-6

### FOREST PLAN

Suring et. al., 1988-----	3-16
TLMP Record of Decision, 1997 -----	1-7, 3-55
TLMP, Appendix N, p. 22, 1997 -----	3-6
Transition meeting, 1997 -----	1-7, 3-16, 3-18, 3-27

### NEPA DOCUMENTS

N&E Kuiu FEIS, 1993 -----	1-1, 1-8, 3-36
---------------------------	----------------

### FOREST SERVICE HANDBOOK

FS Soil and Water Conservation Handbook R10 Amend. No. 2509.22-96-1-----	3-36
USDA Forest Service, 1997a-----	3-33

### FOREST SERVICE DOCUMENTS

Iverson, 1996-----	3-27
USDA Forest Service, 1992a-----	2-6, 3-9
USDA Forest Service, 1995a-----	3-35
USDA Forest Service, 1995b -----	3-58
USDA Forest Service, 1997b -----	3-58
USDA Forest Service, 1997c-----	3-54
USDA Forest Service, 1997e-----	3-5
USDA Forest Service, 1997f-----	3-39
USDA Forest Service, 1997g -----	3-42
USDA Forest Service, 1997h -----	3-39

### OTHER FEDERAL DOCUMENTS

USCOE, 1987 -----	3-54
-------------------	------



# **Chapter 1**

## **Purpose and Need**



# Chapter 1

## Purpose and Need

### Definitions

**Disturbance Ecology** – Is the study of disturbances and the consequences of the dynamics for the understanding of populations, communities, and ecosystems. A disturbance is any relatively discrete event in time that disrupts ecosystem, community, or population structure and changes resources, substrate availability, or the physical environment. (Pickett and White, 1985)

**Land Use Designation (LUD)** – (As used in the 1997 Forest Plan Revision:) A defined area of land with specific management direction.

**Land Use Prescriptions** – Specific management direction applied to a LUD to attain multiple use and other goals and objectives.

**MBF** – Thousand board feet of timber

**MMBF** – Million board feet of timber

**Scoping Process** – is the term used to describe the process of finding the key issues for a project by contacting interested individuals and agencies to determine their concerns.

**Tongass Land Management Plan (TLMP)** – The 10-year land allocation plan for the Tongass National Forest. The Forest Plan Revision was completed in 1997 and is also known as the Forest Plan.

## Introduction

Alaska Wilderness Recreation and Tourism Association (AWRTA), et al vs. Morrison, et al resulted in a settlement agreement that “maintained an injunction pending compliance with NEPA and ANILCA Section 810” for certain units approved in the North and East Kuiu Final Environmental Statement (FEIS) Record of Decision (ROD).

The un-roaded east Kuiu portion, which was the basis of a subsistence finding of “a significant possibility of a significant restriction” was separated from the already developed north Kuiu area (N&E Kuiu FEIS, 1993).

This Environmental Impact Statement (EIS) documents our efforts to comply with the AWRTA settlement agreement and make decisions about possible timber sales within the Crane and Rowan Mountain project area on north Kuiu Island. These decisions will be based upon laws and other direction and upon public needs and concerns.

In this DEIS we describe a Proposed Action and three other alternative approaches to

# 1 Purpose and Need

harvesting timber and building and maintaining roads to make timber on north Kuiu Island available for harvest within the project area. The No Action Alternative is presented and the agency's Preferred Alternative is identified. We have also disclosed the environmental effects and resource outputs expected from the Proposed Action and each of the alternatives.

We developed alternatives to address concerns from the public and from the Forest Plan. The key issues addressed are Habitat Conservation, Watershed Effects, Timber Economics and Scenery. A management strategy to maintain natural forest disturbance patterns is used to address several of the issues.

## Project Area

### Location

The Crane and Rowan Mountain project area is located about 70 miles west of Petersburg on the north end of Kuiu Island in southeast Alaska. The project area is approximately 150,000 acres in size (approximately 30% of the island) and includes value comparison units (VCU's) 398, 399, 400, 401, 402, 421 and the portion of VCU 420 that is west of Port Camden.

Kuiu Island is a moderately large island in the middle of the Alexander Archipelago, approximately 500,00 acres in size. To the east is Kupreanof Island (approximately 850,000 acres). To the west is Baranof Island (approximately 1,010,000 acres). To the south is Prince of Wales Island (the third largest island in the United States at approximately 3,000,000 acres,) and Admiralty Island (approximately 1,030,000 acres) is to the north.

## Overall Direction for the Project

National Forest planning involves several levels of decisions. The decision-making begins with long-range planning at the national level, continuing down through the regional and forest levels to the project level. This DEIS is a project level analysis that implements direction provided at these higher levels.

### National Level

The 1990 Program and Assessment, developed in accordance with the Forest and Rangeland Renewable Resources Planning Act of 1974 as amended, provides national direction for the management of national forests and grasslands. An assessment of the forest and rangeland renewable resources is required every 10 years, and development of a program for managing those resources is required every 5 years.

### Regional Level









The Alaska Regional Guide (USDA Forest Service, 1983) addresses issues specific to Alaska, and establishes management standards and guidelines for the Tongass National Forest. The Tongass Land Management Plan (TLMP, USDA Forest Service, 1997) incorporates and amends this regional direction.

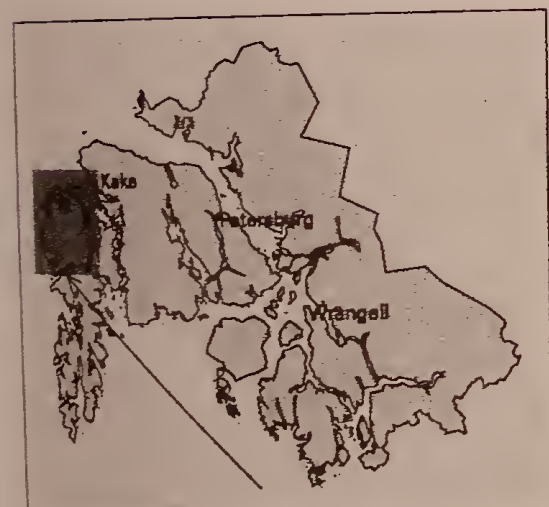
### Forest Level

The National Forest Management Act of 1976 (NFMA) directs each Forest to prepare an overall plan of activities. The Tongass Land Management Plan (signed in May 1997, and referred to as the Forest Plan or TLMP in this document) responds to NFMA and provides broad management direction for the lands and resources in the Tongass National Forest in southeast Alaska. Forest goals, anticipated outputs, and schedules of proposed management activities are included in the Forest Plan. The Forest Plan designates all Tongass National Forestland to one of 19 Land Use Designations (LUD's) or "zones" and provides standards and guidelines for each LUD to meet this multiple use mission. Figure 1-3 shows the LUDs for all of Kuiu Island (TLMP, 1997).

Figure 1-1  
Project Area Vicinity Map

Legend

-  Crane/Rowan Mt. Project Area Boundary
-  Existing System Roads
-  Shoreline, Lakes, Class I/II Streams
-  Existing Clearcut Harvest Units
-  Existing Partial Cut Harvest Units
-  Non Timber LUDs
-  Non-National Forest Lands
-  Log Transfer Facility (LTF)



STIKINE AREA VICINITY MAP  
MAP AREA SHOWN IN DARK GREY

0 13122 26244



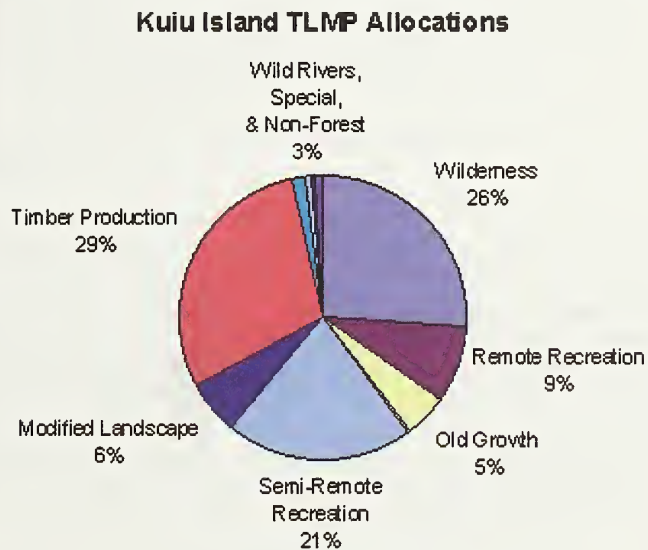
\\g:\projects\crane\_rowan\plots\docmaps\vicinity.map  
fsmmap.xml and vicinity.xml 07/01/88





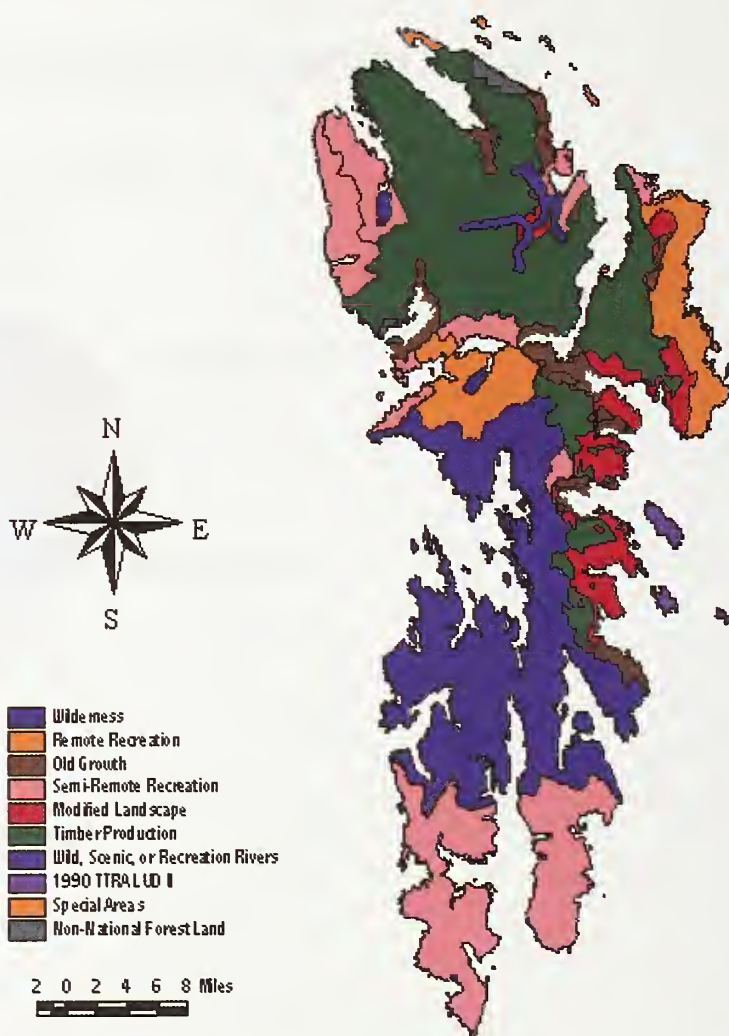
Figure 1-2 displays the breakdown in percentages of the Kuiu land use designations. The center of the island is in designated Tebenkof and Kuiu Wilderness Areas. Including the Wilderness Areas, approximately two-thirds of the island is in non-development land use designations. The other one-third is in production LUDs where timber management is allowed. Within the areas allowing timber production, the first 1000 feet of the beach fringe and estuaries have timber harvest restrictions, and all fish habitats have at least 100-foot buffers.

**Figure 1-2 Kuiu Island Land Use Designations (LUDs)**



# 1 Purpose and Need

Figure 1-3 Kuiu Island TLMP Allocations



## Forest Plan Direction

The Forest Plan provides a framework for considering project-level decisions such as the Crane and Rowan Mountain Timber Sales. Projects must undergo appropriate site-specific analysis, and comply with applicable requirements for public participation, environmental analysis and disclosure, and the administrative appeal procedure before a final decision and implementation.

The primary LUD for the Crane and Rowan Mountain project area is Timber Production. The western portion of Security Bay including the outside coast south past Washington Bay is Semi-Remote Recreation and includes Wild, Scenic, or Recreation River (WSR) designation for Fall Dog Creek. It is also designated a medium old growth reserve. Portions of Kadake Creek have also been designated WSR. The LUD for the West Side of Port Camden is Modified Landscape in the foreground and Timber Production in the background. Old growth reserves (Old Growth LUD) have been designated on Kuiu Island that combined with Wilderness and other areas restricting management disturbance address wildlife viability issues (See Figure I-3 for a map of the Kuiu LUD's).

The Desired Conditions for all LUDs are found in the Forest Plan. The Timber Management Desired Condition states:

*“Suitable timber lands are managed for the production of sawtimber and other wood products on an even-flow, Long-term Sustained Yield basis; the timber yield produced contributes to a Forest-wide sustained yield. An extensive road system provides access for timber management activities, recreation uses, hunting and fishing, and other public and administrative uses; some roads may be closed, either seasonally or year-long, to address resource concerns. Management activities will generally dominate most seen areas. Tree stands are healthy and in a balanced mix of age classes from young stands to trees of harvestable age, often in 40- to 100-acre stands. Recreation opportunities, associated with roaded settings from Semi-primitive to Roaded Modified, are available. A variety of wildlife habitats, predominantly in the early and middle successional stages, are present.” (TLMP, 1997).*

## Transition to the New Forest Plan

The Record of Decision for the recently signed Forest Plan recognizes four categories of timber sale projects to provide for the orderly transition to the new standards and guidelines. The Crane and Rowan Mountain Timber Sales Project falls within Category 3 which includes “timber sale projects now being planned but for which a NEPA decision document will not be signed before the effective date of the plan” (TLMP Record of Decision, 1997). Projects in Category 3 must be consistent with all applicable management direction of the revised plan, except for the new standards and guidelines for wildlife which address landscape connectivity, endemic terrestrial mammals, goshawk, and American marten.

These measures will be incorporated where needed in the projects in this category in a manner that is least disruptive to the design and implementation of the projects. The extent to which these measures should be incorporated into the sales will be determined through review by an Interagency Implementation Team consisting of the National Marine Fisheries Service (NMFS), Environmental Protection Agency (EPA), U. S. Fish and Wildlife Service (USF&WS) and pertinent Alaska State agencies.

A consultation meeting was held on October 9-10, 1997 with NMFS, USF&WS, EPA, ADGC, ADEC, and ADF&G (Transition meeting, 1997). All parties were asked for comments relative to the issues of wildlife landscape connectivity, endemic terrestrial mammals, goshawk, and American marten. The USF&WS raised a concern about the shape and location of the old growth reserve that is located near the head of Saginaw Bay. It was noted that none of the proposed units in the Crane and Rowan project area were near the old

# 1 Purpose and Need

growth reserve in question and would therefore not have an effect on connectivity. A subsequent meeting with the USF&WS addressed their concern (see Habitat Conservation Section, Chap. 3). No other concerns were raised during this meeting.

## Purpose and Need

The Crane and Rowan Mountain Timber Sales project is proposed at this time to respond to the goals and objectives identified by the Forest Plan and to move the project area towards the desired future condition. The Forest Plan identifies the following goals for the Timber Land Use Designation lands within the project area:

- To maintain and promote industrial wood production from suitable timberlands, providing a continuous supply of wood to meet society's needs.
- To manage these lands for sustained long-term timber yields.
- To seek to provide a supply of timber from the Tongass National Forest which meets the annual and planning-cycle market demand, consistent with the standards and guidelines of this Land Use Designation.

The Crane and Rowan Mountain Timber Sales project will respond to these goals by using an ecosystem management approach to moving the project area toward the desired future condition identified by the Forest Plan. We will accomplish this by incorporating the principles of disturbance ecology. We will manage suitable timberlands for the production of sawtimber and other wood products while maintaining the natural disturbance patterns found within the project area that provides a range of wildlife habitat. More detailed information on timber market demand, local employment opportunities and timber harvest scheduling can be found in Appendix A (TLMP, 1997).

## Proposed Action

At the start of our project planning process we defined a "proposed action" so that the public and other agencies can know more about the project. The "proposed action" identified at the start of a project does not necessarily end up being the "preferred" alternative in the DEIS or the "selected" alternative described in the Record of Decision.

The Proposed Action (Alternative 2) is to harvest approximately 23 MMBF of timber from 738 acres. About 6.6 miles of specified road and 2.4 miles of temporary road would be constructed. The existing Rowan Bay log transfer facility (LTF) would be used for transport of logs by barge.

## Background

For this project, we chose to put forth as the proposed action the units as they were shown in the North and East (N&E) Kuiu EIS with the new Forest Plan Standards and Guidelines applied. The timber harvest units were originally part of the N&E Kuiu Record of Decision (N&E Kuiu FEIS, 1993) which made timber available to the Alaska Pulp Corporation under the now terminated APC long term timber sale contract. Efforts to sell portions of the N&E Kuiu units under the Stikine Area's independent timber sale program were legally challenged (AWRTA v. Morrison) resulting in a Settlement Agreement, which required further NEPA consideration. The Stikine Area then decided to separate the unroaded east Kuiu area from the already developed north Kuiu area and begin the NEPA process for the two timber sales being considered here.

The Crane and Rowan Mountain Timber Sales NEPA process began as two separate Environmental Analyses (EAs). In response to public input, we decided to document the analysis of these two proposed timber sales in this EIS.

## Decision to be Made

The Crane and Rowan Mountain Timber Sales EIS, as a project-level analysis, does not address decisions made at higher levels such as the Forest Plan. It does implement direction provided at those higher levels.

The Stikine Area Forest Supervisor is the deciding official and will decide:

- If, where and how much harvest will occur in the Crane and Rowan Mountain project area,
- The locations and design of road construction and potential reconstruction,
- Whether there may be a significant restriction on subsistence uses,
- What mitigation measures and monitoring will be implemented, and
- The degree to which the project will mimic natural disturbance processes to maintain the natural disturbance patterns existing in the project area.

## Public Involvement

### Scoping

**“Public Scoping”** is the term used to describe the process of finding the key issues for a project by contacting interested individuals and agencies to determine their concerns. The north Kuiu project area has been the subject of many planning efforts since the 1970’s. Scoping results from those projects have been used to design this timber sale project. As a condition of the settlement agreement in the AWRTA v. Morrison case, three public meetings were held in Kake and one in Point Baker to discuss the management of Kuiu Island including future timber sales. A report on these meetings is available in the planning file for this project as well as in the planning record for the TLMP revision. The following is a list of letters, contacts, and meetings that took place during the planning of this project.

Spring, Summer and Fall, 1997– Stikine Area Project Schedule lists this project

April, 1997 – Initial scoping letter and newspaper announcements

August, 1997 – Public Scoping Update after decision to do an EIS

August 1997 – Notice of Intent is published in the Federal Register

November, 1997 – Public Open House in Petersburg and Kake

Various meetings, field trips, and written correspondence with individuals, agencies, and organizations including: Alaska Dept. of Fish and Game, National Marine Fisheries Service, U.S. Fish and Wildlife Service, Alaska Department of Environmental Conservation, the Office of General Counsel.

## Key Issues

Based on the responses to public scoping and on internal concerns, we refined the list of preliminary issues from the scoping letters and the Notice of Intent into key issues. These issues are within the scope of project analysis and are used to create different action alternatives.

# 1 Purpose and Need

## Habitat Conservation

**Issue** – The degree to which each alternative affects wildlife habitat. We will focus on habitat for deer and marten.

**Comments** – Many individuals and agencies expressed concern about fragmentation and connectivity for wildlife species and their habitat requirements. Concerns were expressed regarding the goshawk, wolf, and peregrine falcon. Also of concern are the potential impacts to deer populations and their contribution to subsistence use.

**Measurement** – We will use wildlife habitat capability models to compare the changes in habitat between the alternatives. We will also measure the number of acres of different prescriptions and discuss the impacts to important wildlife habitat.

We will mimic the natural disturbance processes across the landscape as a way to address forest fragmentation and connectivity. We'll measure this by comparing the forest mosaic in terms of habitat suitability at several different time periods and landscape levels. We will describe how each action alternative will contribute to the desired future condition.

## Watershed Effects

**Issue** – The degree to which watersheds are at risk for undesirable flow response and reduction in water quality.

**Comments** – The public comment included concerns about cumulative watershed effects.

**Measurement** – We calculate the proposed and cumulative road miles and harvest acres in major watersheds.

## Timber Economics

**Issue** – The degree to which each alternative provides an economic timber sale.

**Comments** – There was concern about the rising costs associated with logging especially where conventional yarding methods are replaced by helicopter yarding. The miles of existing and proposed roads were also concerns for harvest economics.

**Measurement** – We will estimate the volume to be harvested in each alternative and show the relative costs and benefits at an average market of using different yarding systems. We will also show the miles of road to be constructed and display how this affects economics.

## Scenery

**Issue** – The degree to which each alternative will affect the landscape character of the Crane/Rowan Mountain project area, and to what extent harvest units are designed to maintain scenic quality as outlined in the Forest Plan.

**Comments** – Comments were received addressing the potential impacts of timber harvesting on the scenic quality, particularly as seen from Chatham Strait and other saltwater viewing locations. Other concerns expressed maintaining a pristine condition for all of Kuiu Island. Individuals specifically mentioned scenic considerations along the face of Rowan Mountain.

**Measurement** – We will describe the Visual Quality Objective (VQO) achieved in each alternative and compare it to those adopted in the Forest Plan. We will measure the cumulative level of visual disturbance in each VCU and compare the alternatives.

## Other Environmental Considerations

Other resource issues are important, but were not used to drive alternative development. The main effects on recreation are related to the scenery issue and will be covered in that section. The other recreation effects will be minimal and similar regardless of the alternative picked. Other resources are protected to such a degree by the Standards and Guidelines in the Forest Plan and by other laws and constraints that the effects from each of the alternatives are not

significant and are essentially the same. A more detailed discussion of these important resources and the protection measures used for them is in the Other Environmental Considerations section in Chapter 3 starting on page 3-51.

## Issues Outside the Scope of this Analysis

These are issues raised by the public that are beyond the scope of this document. We received comments from people who wanted no more timber harvest on Kuiu Island and from people who wanted more of Kuiu Island to be made available for timber harvest. The difficult task of allocating land to different uses was done in the Forest Plan (TLMP, 1997). The Plan looks at multiple use for the Tongass as a whole and determines what areas are best used in what ways. These land allocation issues are outside the scope of this project level analysis.

## Federal and State Permits, Licenses, and Certifications

The appropriate permits have been obtained from the following agencies:

### **U.S. Army Corps of Engineers**

- Approvals of discharge of dredged or fill material into waters of the United States (Section 404 of the Clean Water Act of 1977, as amended).
- Approval of construction of structures or work in navigable waters of the United States (Section 10 of the Rivers and Harbors Act of 1899).

### **U.S. Environmental Protection Agency**

- Storm water discharge permit.
- National Pollutant Discharge Elimination System review (Section 402 of the clean Water Act).

### **State of Alaska, Department of Natural Resources**

- Authorization for occupancy and use of tidelands and submerged lands.

### **State of Alaska, Department of Environmental Conservation**

- Certification of compliance with the Alaska Water Quality Standards (Section 401 Certification).
- Solid Waste Disposal Permit (Section 402 of the Clean Water Act).

## Legislative and Executive Orders Related to This EIS

Shown below is a list of some of the laws and executive orders pertaining to preparation of EISs on Federal lands. Some of these laws are specific to Alaska, while others pertain to all Federal lands.

- National Historic Preservation Act of 1966 (as amended)
- Wild and Scenic Rivers Act of 1968, amended 1986
- National Environmental Policy Act (NEPA) of 1969 (as amended)
- Clean Air Act of 1970 (as amended)
- Alaska Native Claims Settlement Act (ANSCA) of 1971
- Marine Mammal Protection Act of 1972
- Endangered Species Act (ESA) of 1973 (as amended)
- Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 (as amended)
- National Forest Management Act (NFMA) of 1976 (as amended)
- Clean Water Act of 1977 (as amended)
- American Indian Religious Freedom Act of 1978
- Alaska Native Lands Conservation Act (ANILCA) of 1980
- Archeological Resources Protection Act of 1980
- Cave Resources Protection Act of 1988
- Tongass Timber Reform Act (TTRA) of 1990
- Executive Order 11988 (Floodplains)
- Executive Order 11990 (Wetlands)
- Executive Order 11593 (Cultural)
- Executive Order 12962 (Aquatic Systems and Recreational Fisheries)
- Executive Order 12898 (Environmental Justice)

In addition, the Coastal Zone Management Act (CZMA) of 1972, as amended pertains to this EIS. Federal lands are not included in the definition of the coastal zone as prescribed in the CZMA. However, the act requires that when Federal agencies conduct activities or development that affect the Coastal Zone, that agency's activities or development be consistent to the maximum extent practicable with the approved State Coastal Management Program. The U. S. Forest Service makes this determination.

The Alaska Coastal Management Plan incorporated the Alaska Forest Resources and Practices Act of 1979 (amended in 1990) as applied standards and guidelines for timber harvesting and processing. The Forest Service Standards and Guidelines and Mitigation measures described in Chapter 2 of this document are equal to or exceed State Standards.

## Availability of the Planning Record

An important consideration in preparation of this EIS has been reduction of paperwork as specified in 40 CFR 1500.4. In general, the objective is to furnish enough site-specific information to demonstrate a reasoned consideration of the environmental impacts of the alternatives and how these impacts can be mitigated.

The Planning Record contains detailed information used in creating the EIS and is available upon issuance of the EIS at the Stikine Area Supervisors Office, Petersburg, Alaska. Other reference documents such as the Tongass Land Management Plan, the Tongass Timber Reform Act, the Resources Planning Act, and the Alaska Regional Guide EIS are available at public libraries around the region as well as at the Stikine Area Supervisors Office and other Forest Service offices in the Alaska.



# **Chapter 2**

## **Alternatives**

15. 1000000

1000000

# Chapter 2

## Alternatives

### Definitions

**Age Class** – A distinct generation of trees developing after a disturbance event. This is also referred to as a cohort.

**Biological Legacies** – The structural components that are retained from the previous stand into the next stand. The structural components may be snags (dead trees), coarse woody debris, and green trees (TLMP, 1997).

**Canopy** – The more or less continuous cover of branches and foliage formed collectively by the crowns of adjacent trees.

**Overstory** – The portion of trees in a forest that forms the upper most layer of foliage.

**Stand** – A group of trees occupying a specific area and sufficiently uniform in composition, age, arrangement, and condition as to be distinguished from the trees in adjoining areas.

**Understory** – Small trees, shrubs, forbs and other plants found beneath the overstory trees comprising the forest.

**Volume Strata** – Divisions of timber volume derived from the interpreted timber type (TIMTYP) and the common land unit data layer (CLU). Three volume strata (low, medium, and high) are recognized in the Forest Plan for each Administrative Area.

**Windthrow** – The act of trees being uprooted or snapped off by the wind. There are generally three types of windthrow – endemic where individual trees or small groups are blown over creating small gaps; catastrophic where a major windstorm can blow down hundreds of acres; and management related, where the clearing of trees in an area makes the adjacent standing trees vulnerable to windthrow.

## Introduction

This chapter describes the process used to develop alternatives to the Proposed Action. We discuss the alternatives in detail, summarize those alternatives dropped, identify mitigation measures, and briefly compare the alternatives. We also identify a Preferred Alternative (Alternative 4) which goes the furthest to introduce the concepts of disturbance ecology which in conjunction with the Forest Plan old growth reserves helps to maintain wildlife habitat and addresses subsistence concerns.

## Alternative Development

An alternative is a set of activities designed to accomplish the goal described in the Purpose and Need section of Chapter 1. The Proposed Action (Alternative 2) is one approach to harvesting timber in the Crane and Rowan Mountain project area. We will describe that and

## 2 Alternatives

### Natural Disturbance

three other action alternatives. These action alternatives respond to the following key issues that were identified during our public involvement process, Habitat Conservation, Watershed, Timber Economics, and Scenery.

The major concept used to address the key issues relates to the way forests develop and ecosystem processes occur over time because of natural disturbance (Nowacki and Kramer, 1997). Based on what we know about the natural disturbance on Kuiu Island, we developed alternatives to maintain key natural disturbance processes in the harvest units. By doing this, we anticipate that the effects of timber management on wildlife habitat especially, but also other resources, will be minimized while still harvesting some timber to respond to the need for timber in southeast Alaska. It is not possible to entirely emulate natural disturbance patterns and associated ecological processes in a managed forest, especially on north Kuiu Island due in part to the past even-aged management. The extent to which we maintain natural disturbance in each alternative helps us analyze potential effects on other resources. We will discuss the degree to which each alternative maintains natural disturbance patterns and how this relates to the other key issues in Chapter 3.

The predominant agent of natural disturbance in the project area is wind. The effect of storms ranges from individual trees to entire stands blowing over. Catastrophic windstorms occur approximately every 100-years on Kuiu and well within the lifetime of dominant forest trees (Kramer, 1997). The strongest windstorms on Kuiu Island usually come from the southeast to southwest (Kramer 1997, Harris 1989). As a consequence, over the long term, forests directly exposed to windstorms originating from the south show evidence of greater disturbance than those with topographic protection (Kramer 1997). Blowdown patches frequently extend onto east- and west-facing slopes where winds tend to accelerate as they round mountain flanks (Harris, 1989). The result of windthrow on the forest landscape is a mosaic of stands of differing ages and types. Forest development following disturbance are described in Forest Stand Dynamics (Oliver and Larson, 1996) and are briefly stated below:

Stand Initiation – The stand initiation stage begins after large scale, natural or human induced disturbance. The former overstory is gone and a new stand begins to grow. This stage is characterized by a wide variety of plant species and continues until a new, complete, tree canopy forms and begins to shade out the understory. This generally occurs in 25 –35 years (Alaback, 1982).

**Figure 2-1** Stand Initiation Stage Resulting from Catastrophic Windthrow



## 2 Alternatives

**Stem Exclusion** – The stem exclusion stage follows and is characterized by high tree mortality. Trees die as they get crowded out and regeneration is precluded because the thick, new canopy restricts growing space and light. There are few understory plants because of the lack of light on the forest floor. Our field observations suggest this stage lasts about 100 years on most sites.

**Figure 2-2 Stem Exclusion Stage**



**Understory Reinitiation** – The canopy begins to open up as trees mature and die for various reasons. As space and light become available, understory plants appear on the forest floor, and new trees establish and grow. The length of this stage varies greatly. Field data collected on Kuiu Island suggests this stand stage typically persist for 150 to 250 years with a few examples reaching 500 years or more. Depending on the frequency of major storms, many stands on exposed slopes never progress beyond this stage.

**Figure 2-3 Understory Reinitiation Stage**



## 2 Alternatives

Old Growth<sup>1</sup> – The old growth stage appears when the stand has many small groups or individual trees of different ages (Oliver and Larson, 1996). Distinct age classes are not present. Stand structure characteristics traditionally associated with old growth exist, including large and deformed trees with heavy and craggy limbs, standing snags, multiple canopy layers, and large dead wood accumulation on the forest floor and in streams, etc. Death of one or a few overstory trees permits the growth of small patches of young trees. This process is called gap phase dynamics (Oliver and Larson, 1996). Field data suggests typical times to reach the old growth stage are 250 to 600 years.

**Figure 2-4 Old Growth Stage**



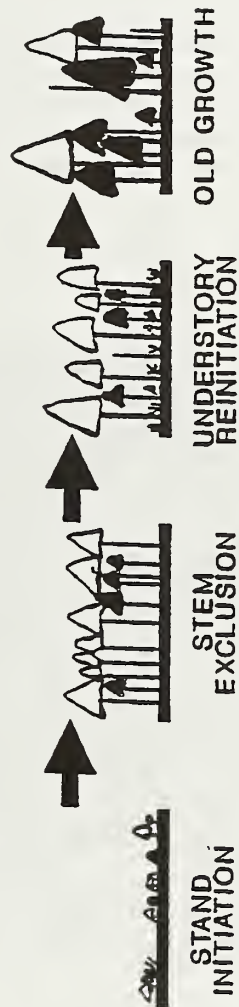
The basic progression through these four stages is graphically depicted in Figure 2-5 (Oliver, 1995). The sequence titled “A. development after stand replacing disturbance” shows the progression after a storm that blows down every tree in a stand. The sequence titled “B. development after partial disturbance” shows the progression when scattered individuals are still standing after the windthrow event. In both graphics, no further disturbance events take place allowing the stand to progress to the old growth stage.

---

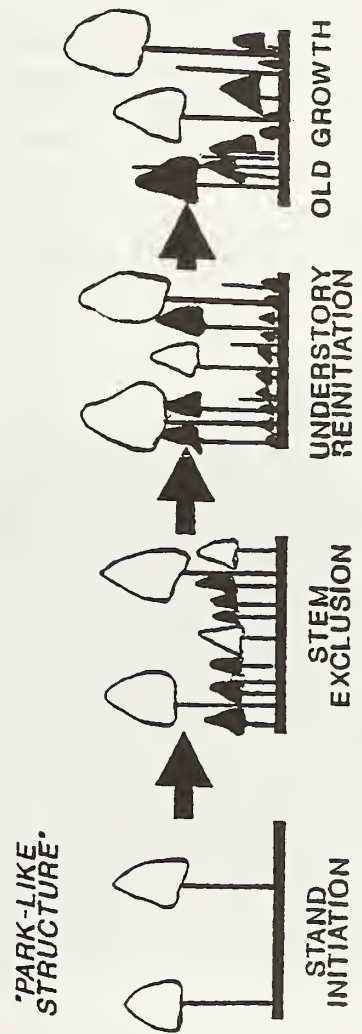
<sup>1</sup>The term ‘old growth’ has been used in many different ways. In this document, we refer to old growth as it relates to the stand development stage defined above. Others have used the term to describe esthetics, wildlife habitat, and the forest of southeast Alaska as a whole. It can also refer to stands with specific structural characteristics regardless of the processes that led to those structures (USDA Forest Service, 1992a).

**Figure 2-5.** Stand Development Stages Following Disturbance.

**A. DEVELOPMENT AFTER STAND-REPLACING DISTURBANCE**



**B. DEVELOPMENT AFTER PARTIAL DISTURBANCE**



We have found that for productive western hemlock and western hemlock/Sitka spruce stands, the progression to the old growth stage usually takes place in wind sheltered areas, mostly the north facing slopes of the project area, since the strongest winds come from the south. In contrast, stands occurring on wind-exposed landscapes, seldom reach old growth as storm intervals seem to be frequent enough to restrict forests to the first three stages of development (Kramer, 1997).

A variety of successional pathways were found to exist on these wind-exposed landscapes (Nowacki and Kramer, 1997). A common progression starts with a partial disturbance. Over time, the stand moves into the understory reinitiation stage. In this stage two distinct age classes are present in the overstory: the individuals left after the stand initiating storm and the trees that started growing right after this storm. Additionally, there is a third age class beginning to develop in the understory (see Fig.2-1, B. Understory Reinitiation). At this point, due to the frequency of major storms, the stand is partially disturbed again (not shown in the graphic). If all the oldest trees blow over, the stand continues to develop with two age classes. If not, the stand structure becomes more complex, now containing three age classes. Many stands never develop more than three age classes, as the oldest age class continually blows over in major storms.

We propose to mimic natural disturbance on two levels: the stand level and the landscape level. At the stand level, we will mimic the pattern of repeated partial disturbance as described above by creating harvest units with two or three age classes of trees. These units will closely resemble the understory reinitiation stage following partial disturbance. In addition, we will mimic the complete stand-replacing event by creating units with few trees left, moving them to the stand initiation stage. At the landscape level, we will maintain the natural patchy pattern of stands existing after windthrow events that leave some stands completely blown down while other nearby stands are only partially blown over. We propose to do this by intermixing units that closely resemble the understory reinitiation stage right after harvest with units that are moved to the stand initiation stage.

The tools that are available for use in maintaining natural disturbance processes at the stand level are discussed in TLMP Appendix G. This appendix lists three groupings of silvicultural systems (ways of managing forests for clearly defined goals (Smith, 1962)). They are even-aged, two-aged, and uneven-aged systems. The silvicultural system applied to each proposed unit is listed on the individual unit cards found in Appendix B. There is also a discussion of which stand development stage the unit is currently in, the desired future condition of the unit, and whether the unit is expected to be in an even-aged, two-aged, or uneven-aged condition over time.

### Silvicultural Systems

#### Even-Aged Systems

Even-aged systems produce stands that consist of trees of the same or nearly the same age. This system mimics the results of stand replacing disturbance events (TLMP, 1997) and moves units to the stand initiation stage. Clear-cutting is the most commonly used method in southeast Alaska to achieve even-aged results. Clear-cutting will be included in all alternatives to varying degrees and for different reasons such as for maintaining a mixture of stand development stages at the landscape level and for logging practicality. For example, we chose many stands that could be logged most economically with downhill cable logging systems to be moved to the stand initiation stage when developing the patchy landscape mosaics.

## Two-aged Systems

Two-aged systems produce stands that contain two age classes. These systems mimic the results of partial disturbance events and create units that closely resemble the understory reinitiation stage. The resulting stand may be two-aged or trend towards an uneven-aged condition due to the retention of reserve trees that may represent more than one age class (TLMP G-11). The specific two-aged method that is proposed for this project is called seed tree with reserves. In this method, all of the seed trees are retained after regeneration to carry over biological legacies of the previous stand into the new stand. We will accomplish this by prescribing diameter limits where trees within a specific diameter range can be cut. Seeds from trees that are left, especially Alaska cedar and Sitka Spruce will be important in maintaining these species on the site (TLMP G-10).

**Figure 2-6** Diameter Limit Harvest With Some Larger Leave Trees, Age One Year



During field reconnaissance we noticed many stands were naturally two-aged. In these stands the largest and oldest trees scattered through the stand were all the same age, initiated after a severe storm hundreds of years ago. Filling in between these legacies were another age class of smaller trees which got their start after a subsequent storm which only partially disturbed the stand.

We intend to maintain this pattern of two distinct *age classes* by retaining two distinct *size classes* in some units in Alternatives 3 and 4. Retained trees over a specified diameter will represent the large, old age class. Retained trees under a specified diameter will represent the smaller, younger age class. The mid-range diameter trees will be harvested to produce wood products. When the available growing space created by this harvest is filled with new young trees, we anticipate the stand to resemble the Understory Reinitiation stage of development after partial disturbance as depicted in Figure 2-5, B.

## 2 Alternatives

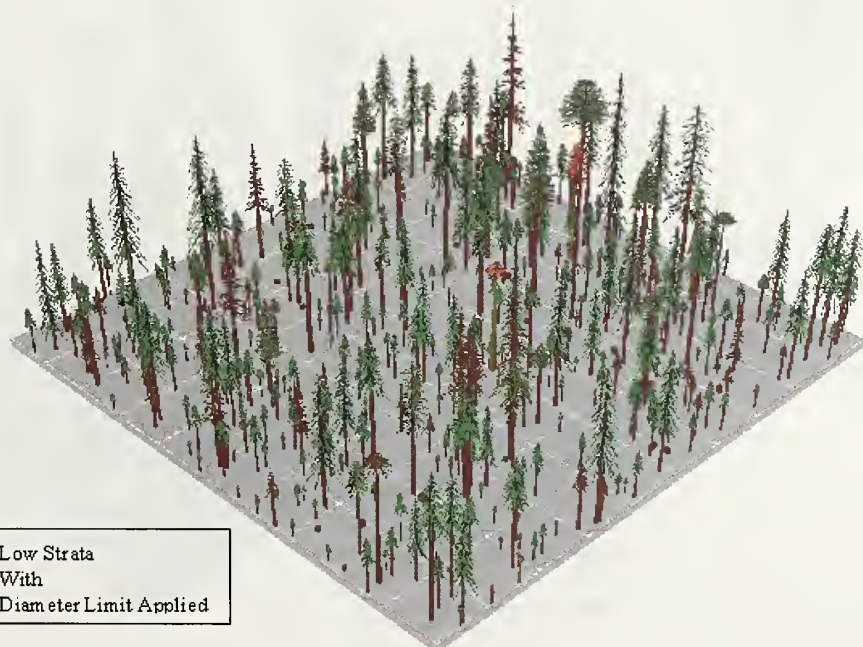
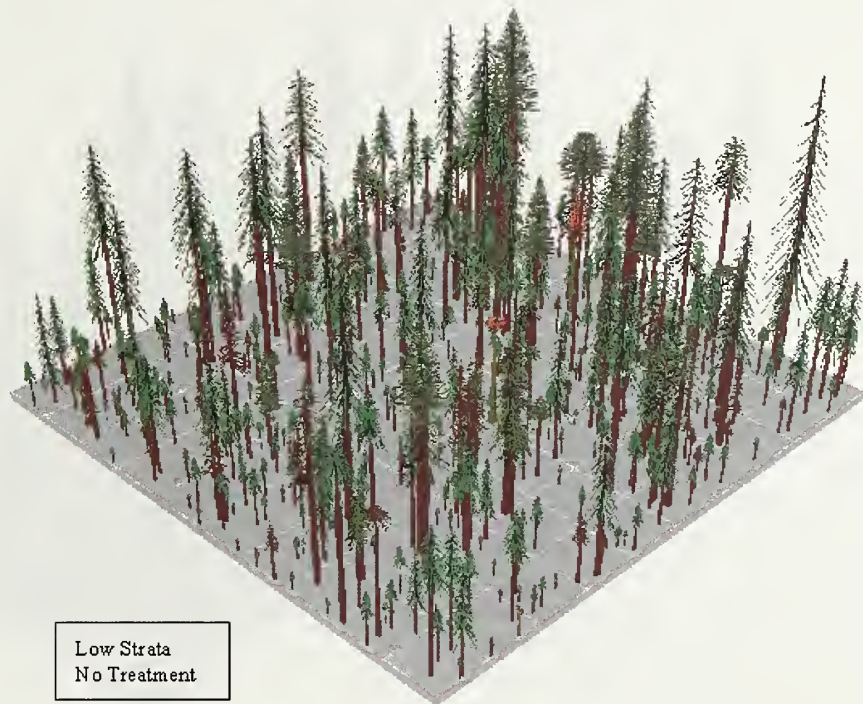
The diameter limit prescription is intended to create stands with an average of 50% of the original canopy cover remaining after harvest. The prescription will leave all hemlock and Sitka spruce trees less than 16 inches and all Alaska cedar less than 24 inches. In addition all western hemlocks greater than 38 inches in diameter and one large, decadent Sitka spruce for every 10 acres will be retained. Where needed, additional large hemlock will be individually marked. We plan to use the same diameter limits on all units managed under the two-aged system. Depending on the size of the trees in the stand to begin with, this will result in diverse stands – some will have many trees left, other stands will have few trees left and still others will be somewhere in-between. This is typical of natural disturbance where a wide range of structural conditions exists following blowdown events (Nowacki and Kramer, 1997). Figures 2-7, 8, and 9 illustrate the changes in stand structure following application of the diameter limit harvest for the high, medium, and low volume strata in the project area.

The diameter limit cut will allow many natural disturbance processes to occur in harvest units. The variety of possible outcomes after harvest will provide a great deal of new information on how to better maintain natural ecosystem function through management. For example, in forests directly exposed to chronic windthrow, over time the greater than 38-inch trees will blow over or snap off as they decay. This will provide the forest floor with large dead wood and may serve an important role in rejuvenating site productivity through uprooting and soil churning (Bormann and others, 1995). The gaps created will stimulate understory shrub and forb production and will also give the less than 16-inch trees and the new young trees room to grow. The stand may tend to remain two-aged with remnant trees providing habitat structures for animals and shade for light-sensitive understory plants (Nowacki and Kramer, 1997). In wind sheltered areas we expect most of the trees left after harvest to remain standing. Over time these stands may trend toward uneven age conditions (TLMP, Appendix G, 1997) and maintain much of the original old-growth-like structure (Pojar and Mackinnon, 1994). In both areas we anticipate that the time these stands spend in the development stage with the least biological diversity, the stem exclusion stage, will be greatly minimized over that experienced following traditional clear-cut harvest techniques.

### **Uneven-aged Systems**

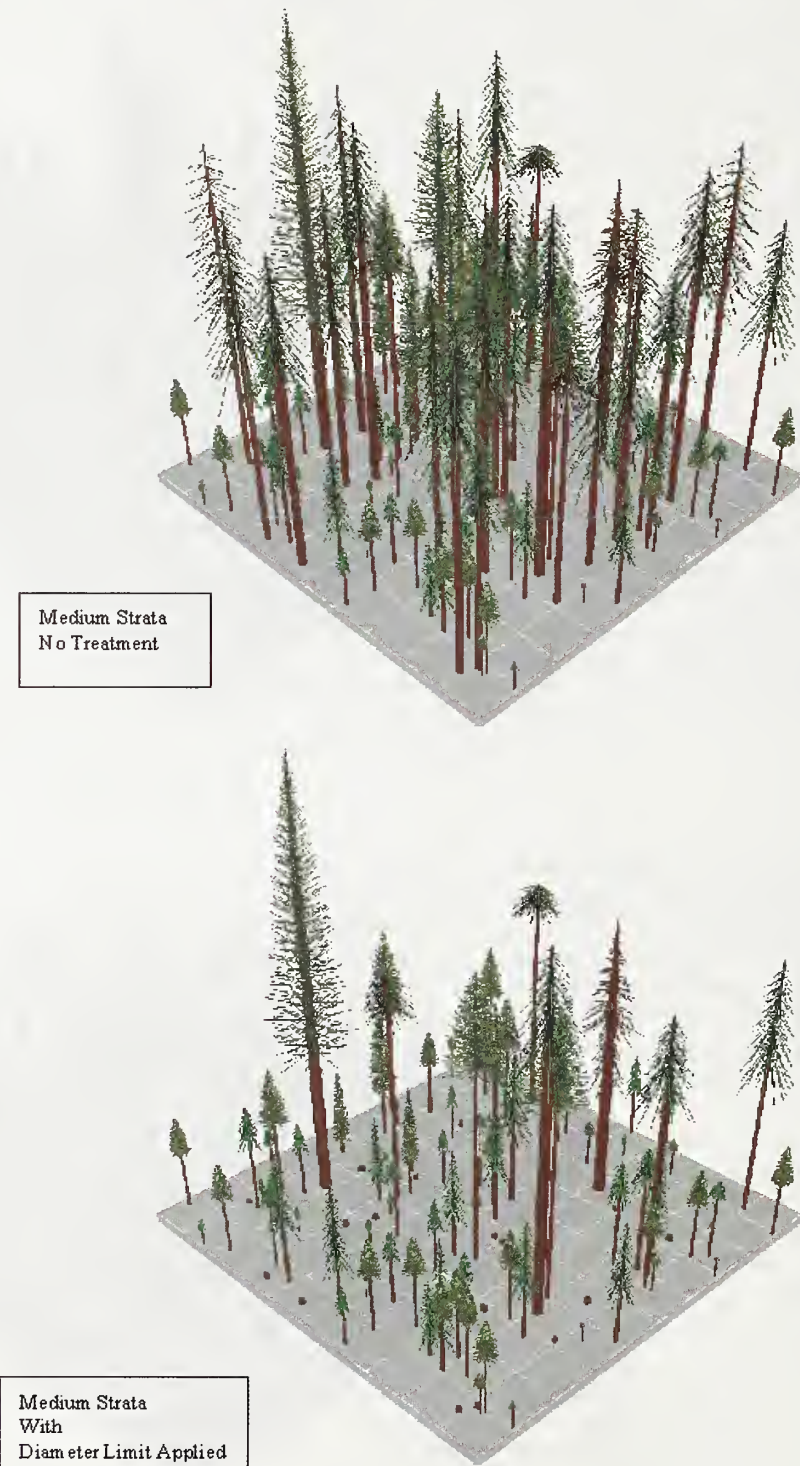
The last silvicultural systems listed in TLMP Revision Appendix G are the uneven-aged systems. These systems are methods of maintaining a many-aged stand with differing tree heights and layers by removing some trees in all age groups either singly, in small groups, or in strips. The first feature of these systems that TLMP lists is complexity of harvesting. We considered prescribing an uneven-aged system on the north aspects where small canopy gap processes predominate, but concluded that we could meet our habitat conservation objective more simply with a two-aged system. This was also a way of giving consideration to the timber economics issue, since the stands we are proposing to operate in with this project are all located in a Timber Production Land Use Designation.

**Figure 2-7. Low Volume Strata With and Without a Diameter Limit Prescription.**

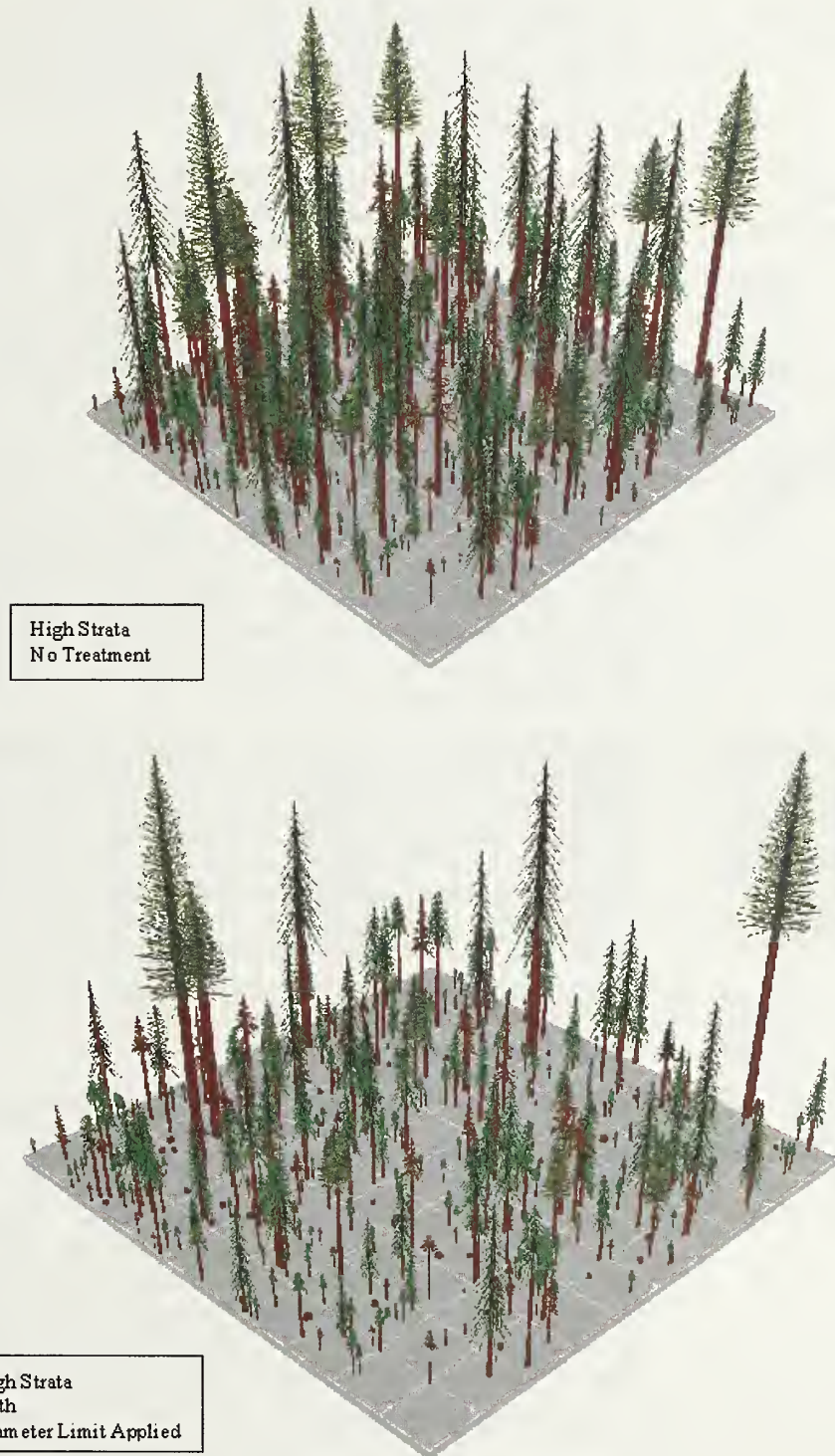


## 2 Alternatives

**Figure 2-8. Medium Volume Strata With and Without a Diameter Limit Prescription**



**Figure 2-9. High Volume Strata With and Without a Diameter Limit Prescription.**



## Alternatives Considered in Detail

### Alternative 1 (No Action)

With this alternative we analyze the effects of having no timber sale or road construction in the Crane and Rowan Mountain project area on the social, physical, and biological environment. This alternative is the most responsive to maintaining current wildlife habitat, scenery and watershed condition by deferring harvest. It would not move the project area toward the desired future condition that is stated in the Forest Plan. Table 2-1 and Figure 2-10 displays the no action alternative.

### Alternative 2 (Proposed Action)

The proposed action would harvest approximately 23 MMBF of timber from about 738 acres. It would offer the second most volume to potential large and small operators and provides the best economic return of all of the alternatives. Table 2-1 and Figure 2-11 displays the specific activities. All of this harvest would be clear-cut<sup>2</sup> and would use cable or helicopter yarding. Approximately 6.59 miles of specified road and 2.42 miles of temporary road would be constructed to access some of this timber and provide infrastructure for future sales. This and all other action alternatives will use the existing Rowan Bay LTF for log barging. This alternative serves as the basis of comparison for the other alternatives.

### Alternative 3

Alternative 3 responds primarily to public concerns surrounding wildlife habitat, scenery and watershed resources. Harvesting some units as partial cuts rather than clear-cuts would reduce fragmentation and watershed and visual impacts. This alternative would harvest approximately 17.8 MMBF of timber from about 738 acres. This includes 210 acres of clear-cut with reserves and 557 acres of partial harvest. Approximately 6.59 miles of specified road and 2.42 miles of temporary road would be constructed to access some of this timber and provide infrastructure for future sales. This and all other action alternatives will use the existing Rowan Bay LTF for log barging. Table 2-1 and Figure 2-12 display the specific activities involved in Alternative 3.

### Alternative 4 (Preferred)

Alternative 4 responds to the timber economics, wildlife habitat and fragmentation, scenery and watershed issues. Alternative 4 comprises all of the units in Alternative 2 except for two. One clear-cut unit in the Security Creek watershed was dropped to lower the risk to watershed resources. On Rowan Mountain, one clear-cut unit was dropped and other partial harvest units enlarged or added to better maintain natural disturbance patterns. This alternative would harvest approximately 24 MMBF of timber from about 1056 acres. This includes 159 acres of clear-cut with reserves and 897 acres of partial harvest. Approximately 6.59 miles of specified road and 1.4 miles of temporary road would be constructed to access some of this timber and provide infrastructure for future sales. This and all other action alternatives will use the existing Rowan Bay LTF for log barging. Table 2-1 and Figure 2-13 display the specific activities involved in Alternative 4.

### Alternative 5

Alternative 5 responds primarily to public concerns surrounding watershed resources and timber economics. This alternative drops all harvest from the Security Creek watershed in order to lower the risk to the watershed resource. Dropping these units would also decrease fragmentation and the impacts to the visual resource in this watershed. This alternative then uses all of the other clear-cut units from Alternative 2 and adds units 402-50 and 402-51 on Rowan Mountain to provide more timber volume. This alternative would harvest approximately 21 MMBF of timber from about 712 acres. This includes 548 acres of clear-cut with reserves and 164 acres of partial harvest. Approximately 6.59 miles of specified road and 1.49 miles of temporary road would be constructed to access some of this timber and provide infrastructure for future sales. This and all other action alternatives will use the

---

<sup>2</sup> Clear-cutting is an even aged silvicultural system used to manage forest stands. All clear-cut systems planned in this project will include retention of wildlife legacies.

existing Rowan Bay LTF for log barging. Table 2-1 and Figure 2-14 display the specific activities involved in Alternative 5.

**Table 2-1. Harvest Units in Alternatives by Prescription (Shading is Helicopter)**

UNIT	ALT 1		ALT 2		ALT 3		ALT 4		ALT 5	
Prescription	CC	DL	CC	DL	CC	DL	CC	DL	CC	DL
399-13	NC	NC	64	0	50	14	50	14	64	0
400-8	NC	NC	29	0	0	29	NC	NC	NC	NC
400-9	NC	NC	33	0	0	33	0	33	NC	NC
400-11	NC	NC	26	0	0	26	0	26	NC	NC
400-12	NC	NC	79	0	0	79	0	79	NC	NC
400-18	NC	NC	59	0	0	59	0	59	59	0
400-22	NC	NC	NC	NC	NC	NC	0	228	NC	NC
402-25	NC	NC	22	0	22	0	NC	NC	22	0
402-26	NC	NC	25	0	17	8	17	8	25	0
402-27	NC	NC	16	0	16	0	16	0	16	0
402-28	NC	NC	7	0	4	3	4	3	7	0
402-29	NC	NC	23	0	0	23	0	23	0	23
402-30	NC	NC	10	0	0	10	0	10	10	0
402-31	NC	NC	8	0	0	8	0	8	8	0
402-32	NC	NC	22	0	0	22	0	22	22	0
402-49	NC	NC	15	0	10	5	10	5	15	0
402-50	NC	NC	NC	NC	NC	NC	0	106	0	106
402-51	NC	NC	NC	NC	NC	NC	0	35	0	35
420-46	NC	NC	38	0	0	38	0	38	38	0
420-47	NC	NC	27	0	0	27	0	27	27	0
420-48	NC	NC	42	0	8	34	8	34	42	0
421-49	NC	NC	97	0	29	68	29	68	97	0
421-50	NC	NC	39	0	12	27	12	27	39	0
421-51	NC	NC	57	0	13	44	13	44	57	0
TOTAL	0	0	738	0	181	557	159	897	548	164

## Alternative Comparison

**Table 2-2** Alternative Comparison

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Harvest Volume (MMBF)	0	23.0	17.8	24.0	21.0
Clear Cut (acres)	0	738	210	159	548
Partial Cut (acres)	0	0	528	897	164
Helicopter Yarding (acres)	0	227	227	629	263
Cable/Shovel Yarding (acres)	0	511	511	427	449
Specified Road (miles)	0	6.59	6.59	6.59	6.59
Temporary Road (miles)	0	2.42	2.42	1.40	1.49
Net Stumpage Value (\$ per MBF)	0	\$48.88	\$5.72	\$19.52	\$34.45
Indicated Advertised Rates (\$ per MBF)	0	\$93.09	\$64.64	\$63.35	\$84.23
Visual Quality Objective Achieved	Retention	Partial retention/Max modification	Partial retention/Modification	Retention/Partial retention	Partial retention/Max modification
POG Harvested Project Area	0	0.64%	0.41%	0.52%	0.54%
Deer Habitat Capability Year 2040	81%	80%	80%	81%	80%
Security Creek Roads (miles)	0	1	1	0	0
Harvest (acres)	0	167 CC	167 PC	352 PC	0
Dean Creek Roads (miles)	0	0	0	0	0
Harvest (acres)	0	47 CC	47 PC	47 PC	47 CC

## Alternatives Dropped From Further Review

We considered including the original selected alternative from the N&E Kuiu EIS as an alternative in this EIS. This alternative was dropped, however, because it doesn't meet the Standards and Guidelines found in the Forest Plan.

## Mitigation Measures for the Action Alternatives

The Forest Service uses a variety of mitigation measures in the design and implementation of timber sales to avoid or reduce impacts to the environment. Law requires some of these mitigation measures; for example, streamside buffers. Some are included as direction from the Forest Plan. Others are very specific to a particular location or unit. These actions and their site-specific application are documented on the unit and road cards in Appendix A. Described below are the mitigation measures we will use for this project under all action alternatives.

### Cultural Resources

Based on inventory work in the Crane and Rowan Mountain project area and elsewhere in southeast Alaska, we developed a model to help us locate those areas where cultural resources are most likely to be found. This model helps identify areas where we will intensively survey for cultural sites prior to any ground-disturbing activity. If additional cultural resources are located, appropriate mitigation and protection will be designed in consultation with the Alaska State Historic Preservation Officer.

### Best Management Practices

Best Management Practices (BMPs) are practices for operating procedures designed to protect water quality. The development of BMPs is mandated by the Clean Water Act. The BMPs for the Tongass National Forest are the result of extensive efforts between the Forest Service and the State of Alaska to identify practices that will ensure that timber harvest activities minimize soil erosion and protect aquatic habitat. The unit and road cards in Appendix A describe site-specific application of BMPs.

### Stream-side Buffers

The Tongass Timber Reform Act mandates a minimum 100-foot wide, no-harvest buffer on both sides of all Class I streams and on those Class II streams that flow directly into Class I streams. The Forest Plan Riparian Standards and Guidelines provide further direction for protection of riparian management areas. Many streamside buffers are wider than the 100-foot TTRA buffer. Specific information about streamside buffers is located on the unit cards in Appendix A.

### Marbled Murrelets

Marbled murrelets are common in the waters around the analysis area. No known nests have been located. If a nest is located, a 30-acre buffer surrounding the nest will be provided. Roads can enter this buffer if unavoidable, but every effort will be made to protect the nest site.

### Goshawks

The goshawk is not presently classified as Threatened and Endangered but it is recognized as a Regional Sensitive Species. Two goshawk nests are known to exist in the project area. A 100-acre buffer has been placed around the nest near Rowan Creek. The other nest is located near Fall Dog Creek and is in an Old Growth Land Use Designation that will not be harvested. If other goshawk nests should be found in the project area during this project we will implement the buffer requirements in the Forest Plan Standards and Guidelines.

## 2 Alternatives

### Key Wildlife Habitats and Timing Restrictions

No harvest is scheduled within 1,000 feet of the beach or within 1,000 feet of estuaries. Minimum clearing widths will be used on the roads. Old growth habitat reserves have been designated in the project area for all alternatives and are shown on alternative maps. These blocks of habitat were selected in the Forest Plan. Harvest is precluded in these areas. In addition, more old growth will remain in areas that are classified as unsuitable for timber production (such as very steep areas and stream buffers).

Helicopter flight guidelines will ensure the protection of eagle nest trees in the project area. Repeated helicopter flights within ¼ mile of nest trees will be avoided from March 1<sup>st</sup> to May 31<sup>st</sup>. If nest trees have young, we will extend additional protection from May 31<sup>st</sup> to August 31<sup>st</sup>.

### Recreation

Most of the recreation use within the project area is water based. The primary method of mitigation for recreation is protecting the visual quality of areas seen from the water. Depending on the alternative, harvest units visible from saltwater are located and designed to reduce visual impact. Buffers along beaches, estuaries, streams and lakes also provide visual screening.

### Wild, Scenic, and Recreational Rivers

Two rivers in the project area, Kadake Creek and an unnamed creek at the head of Security Bay locally known as Fall Dog Creek, have been determined to be suitable for inclusion in the Wild and Scenic River System by the Forest Plan. Kadake Creek was recommended as a Recreational River for 23 miles and Fall Dog Creek was recommended as a Wild River for 4 miles. This recommendation is based on unique values identified in TLMP. Their classification eligibility and outstandingly remarkable values are to be maintained until Congress designates the rivers or decides not to designate them. These will be maintained in all alternatives considered in this EIS.

## Preferred Alternative

The Preferred Alternative is Alternative 4. To recommend a preferred alternative, the Stikine Area Leadership Team evaluated the benefits and impacts of each alternative and gave particular consideration to how each alternative responded to the key issues. Alternative 4 goes the furthest to introduce the concepts of disturbance ecology, which in conjunction with the Forest Plan old growth reserves helps to maintain wildlife habitat and addresses subsistence concerns.

## Project Implementation

During the implementation of a timber harvest project it is not uncommon to learn about site characteristics and site specific resource relationships that may not have been known during the planning process. This additional information may lead to more effective ways to accomplish project objectives, either in the form of more efficient operations or better resource protection, than what was designed at the planning stage. A need to modify the project may result from this new or refined information.

Any proposed changes to this project will be subject to an appropriate interdisciplinary review process. All changes will be subject to the documentation, public involvement, and other requirements of the National Environmental Policy Act (NEPA), the National Forest Management Act (NFMA), section 810 of the Alaska National Interest Lands Conservation Act (ANILCA), the Coastal Zone Management Act (CZMA) and other laws concerning proposed actions.

All changes to project design shall be documented and approved prior to implementation. The Stikine Area Forest Supervisor or, if so designated, the Petersburg District Ranger, will be the deciding officer for any such changes. In determining whether and what kind of further NEPA action is required, the deciding officer will consider the criteria for whether to supplement an existing environmental impact statement (EIS) in 40 CFR 1502.9(c), and in particular, whether the proposed change is a substantial change to the Record of Decision selected alternative, and whether the change is relevant to environmental concerns. The deciding officer will consider whether an environmental assessment (EA) to determine whether a supplement to the existing EIS is required, or whether the change is categorically excluded from preparation of an EIS or EA on the basis of the criteria in Forest Service Handbook (FSH) 1909.15.26.

Minor changes to harvest units, transportation facilities or other project components are expected in a timber harvest project and may be categorically excluded from documentation in an EA or EIS, and will not present sufficient potential impacts to require any specific documentation or other action to comply with other laws. Minor changes may still require appropriate scoping, environmental analysis, documentation in a Decision Memo, and public notice to comply with FSH 1909.15.27.

## Monitoring

Monitoring is designed to determine if the resource objectives of the project have been met. Monitoring is the process of measuring how well the predictions made, the prescriptions assigned, and the determinations decided, achieve the desired results as implemented. The objective of monitoring and evaluating project implementation is to determine (1) if all activities undertaken as part of this project are consistent with the Forest Plan and the Record of Decision for this project, (2) effectiveness of standards and guidelines, (3) costs and effects of project implementation, and (4) need for changes to the decision.

All action alternatives are subject to monitoring and reporting requirements contained in the Forest Plan and in Forest Service Manuals and Handbooks. Monitoring requirements are an essential part of the implementation of this project. Evaluating and reporting results is an essential part of the monitoring process. The Petersburg Ranger District personnel will prepare an annual report, which will be available for review in that office.

The Forest Service uses three classifications for monitoring activities: implementation monitoring, effectiveness monitoring, and validation monitoring. A description of these three types is given below. Specific monitoring items for this project are described on the following pages. Some monitoring items, like research efforts to validate models (such as habitat capability models used in this planning process), and program reviews (such as reviews conducted on a regular basis to assess the quality of engineering work) are not specific to this project and so are not listed on the following pages. They still constitute an important form of monitoring and may include looking at various aspects of this project.

Implementation monitoring answers the question "Did we do what we said we would do?" It is accomplished primarily through harvest and contract inspections by trained sale administrators and contract inspectors as a routine part of project implementation. Sale administrators and contract inspectors have the authority to initiate remedial action including repair of damage that may have been caused by a contractor and suspension of activities under contract until problems have been corrected. This will ensure that all elements of the project are implemented as designed and that standards and guidelines are implemented to protect soil productivity, water quality, fish habitat, and other resources.

## Implementation Monitoring

## 2 Alternatives

### Effectiveness Monitoring

Effectiveness monitoring answers the question "Did our actions accomplish what we intended, and are they the most efficient way to accomplish what we intended?"

Effectiveness monitoring is especially important for evaluating the effectiveness of mitigation measures. The results of this monitoring will be evaluated and compared to expected results at least annually during the life of this project. This kind of monitoring can provide information that may trigger some form of corrective action and also provides a valuable feedback loop for resource specialists and line officers responsible for project planning.

### Validation Monitoring

Validation monitoring is conducted to determine if management actions are resolving important issues. The objective of validation monitoring is to answer the question, "Are we achieving what we intended to achieve?". Normally, validation monitoring is conducted to determine if initial assumptions used to develop alternatives and estimate effects are correct. In some cases it includes cooperative studies with research to test and evaluate predictive models such as wildlife habitat relationships or watershed impacts.

### Monitoring Plan

#### Best Management Practices Implementation

Objective:

Evaluate application of BMPs for water quality and fish habitat protection.

Method:

Follow Alaska Region BMP implementation monitoring protocols. Randomly select completed roads and units with high priority assigned to sites with high risk.

Action:

If protection is inadequate, apply corrective measures. If protection measures are inadequate or unsuitable, modify future recommendations.

Cost:

Approximately \$1,000

#### Best Management Practices Effectiveness

Objective:

Address priorities indicated in Tongass National Forest effectiveness monitoring strategy. Monitoring sites may or may not be selected within the Crane and Rowan Mountain project area.

Action:

If protection is inadequate, modify BMP.

Cost:

Variable

#### Prescription Accomplishment

Objective:

To determine if the Diameter Limit Prescription accomplished the following:

- Does the diameter limit achieve the canopy closure objective?
- Does the diameter limit result in the expected difference between wind prone and wind sheltered stands of large tree windthrow after harvest? (i.e. will stands trend toward 2-aged or uneven-aged as expected?)
- Does the diameter limit result in the expected understory response after harvest?
- Does the diameter limit result in the expected snow intercept?
- Does the diameter limit provide the expected protection to class III stream buffers?

**Method:**

To determine if this objective has been met, IDT members will do field reviews of selected units and document the results

**Action:**

The results will be used to develop future prescriptions

**Cost:**

Approximately \$10,000

**Scenic Resources**

**Objective:**

Determine if harvest prescriptions were effective in meeting the visual quality objective.

**Method:**

IDT will evaluate harvest implementation and effectiveness two years following harvest.

**Action:**

Adjust prescriptions as needed for future planning efforts.

**Cost:**

Approximately \$5,000

**Watershed Resources**

**Objective:**

To determine if harvest prescriptions were effective in providing protection to the watershed resource

**Method:**

Measure streambed particle size distribution using the technique developed by Bevenger and King (1995).

**Action:**

Adjust prescription for future activities as needed.

**Cost:**

Approximately \$10,000

**Regeneration**

**Objective:**

To determine if there is adequate natural stocking within each unit four years after timber harvest.

**Method:**

Field transects of each unit harvested.

**Action:**

If inadequate stocking is indicated, planting will be considered.

Approximately \$15,000

## 2 Alternatives

### **Wildlife – Deer Response**

**Objective:**

How do deer utilize the diameter limit cuts in comparison to areas unharvested and harvested using conventional clear-cut methods.

**Method:**

Deer pellet group counts.

**Action:**

Conduct pellet group counts annually for five years, then every five years.

**Cost:**

Approximately \$10,000

Figure 2-10  
Alternative 1  
(No Action)

Legend

- Existing Partial Harvest
- Existing Clearcut
- (Existing includes harvested and NEPA-approved prior to Crane/Rowan EIS)
- Proposed Clearcut Harvest Units
- Proposed Diameter Limit Harvest Units
- Lakes and Salt Water
  
- FOREST WIND DISTURBANCE PROBABILITY:
- Low (Gap Phase Processes)
- Moderate (Mixed Disturbance Processes)
- High (Stand Replacement Processes)
  
- Helicopter Yarding
- Crane/Rowan Mt Project Area Boundary
- Existing Open Roads
- Existing Closed Roads
- Proposed Roads
- 500-ft Contours



STIKINE AREA VICINITY MAP  
MAP AREA SHOWN IN ORANGE

0 7920 15840



g:\projects\crane\_rowan\plots\docmaps\alt1.map  
altmap.aml and allalts.aml <1> 07/01/98





Figure 2-11  
Alternative 2  
(Proposed Action)

- Legend
- Existing Partial Harvest
  - Existing Clearcut
  - (Existing includes harvested and NEPA-approved prior to Crane/Rowan EIS)
  - Proposed Clearcut Harvest Units
  - Proposed Diameter Limit Harvest Units
  - Lakes and Salt Water
- FOREST WIND DISTURBANCE PROBABILITY:
- Low (Gap Phase Processes)
  - Moderate (Mixed Disturbance Processes)
  - High (Stand Replacement Processes)
- Helicopter Yarding
  - Crane/Rowan Mt Project Area Boundary
  - Existing Open Roads
  - Existing Closed Roads
  - Proposed Roads
  - 500-ft Contours

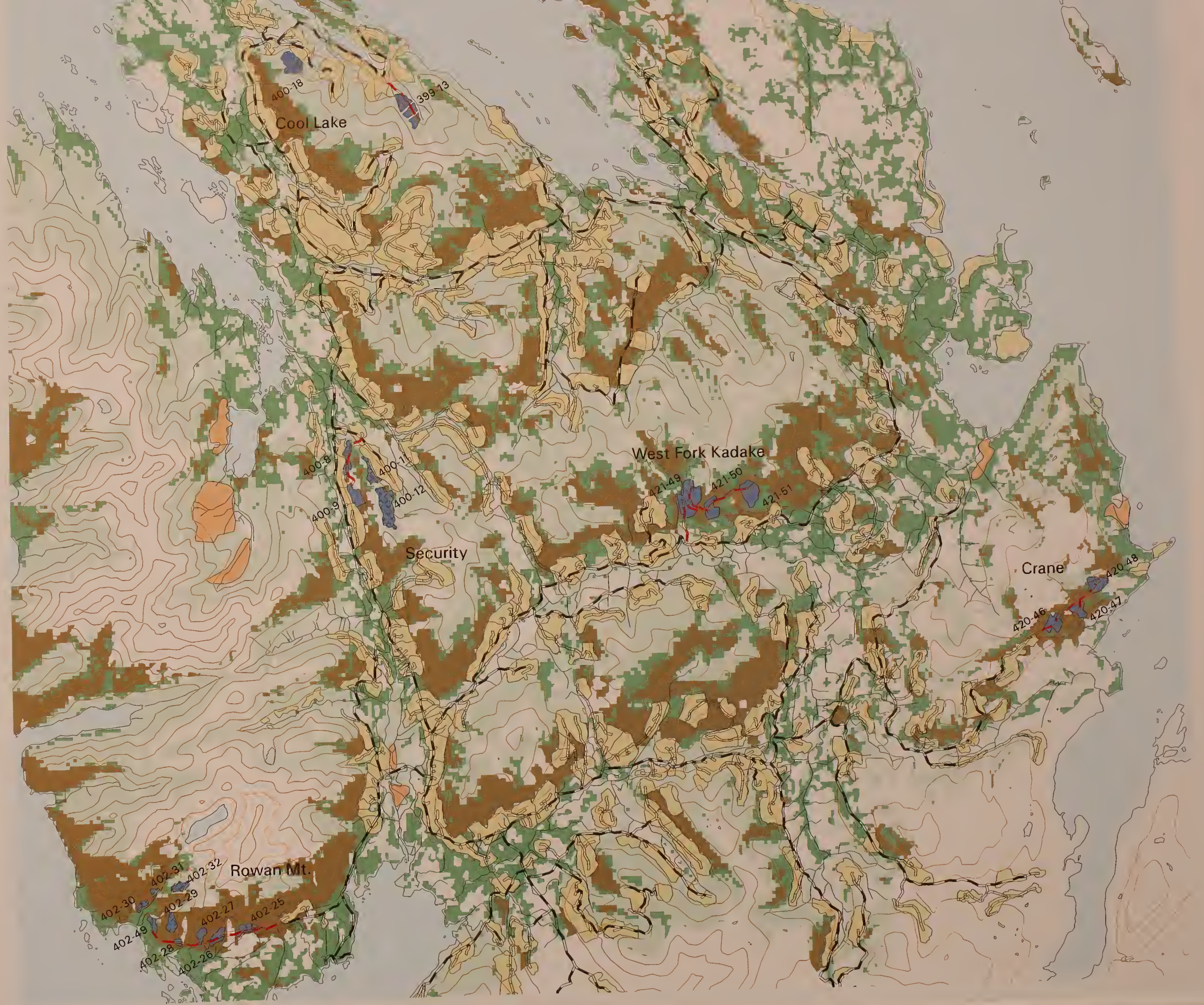
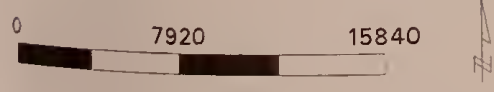
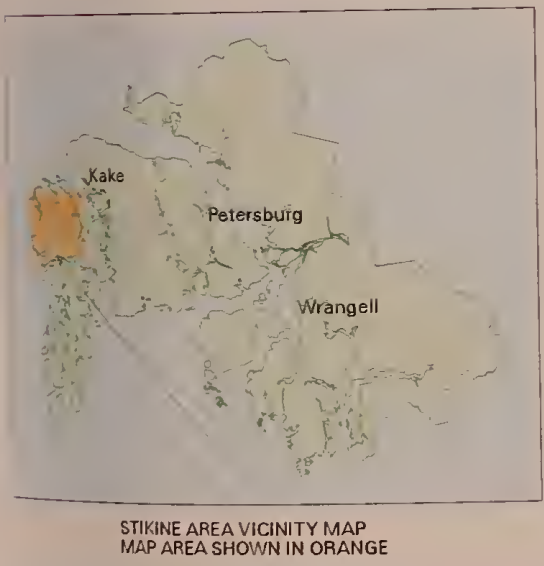
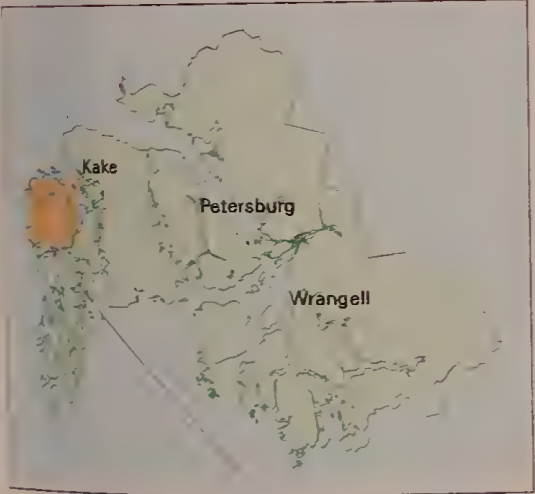


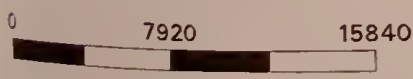


Figure 2-12  
Alternative 3

- Legend
- Existing Partial Harvest
  - Existing Clearcut
  - (Existing includes harvested and NEPA-approved prior to Crane/Rowan EIS)
  - Proposed Clearcut Harvest Units
  - Proposed Diameter Limit Harvest Units
  - Lakes and Salt Water
- FOREST WIND DISTURBANCE PROBABILITY:
- Low (Gap Phase Processes)
  - Moderate (Mixed Disturbance Processes)
  - High (Stand Replacement Processes)
- Helicopter Yarding
  - Crane/Rowan Mt Project Area Boundary
  - Existing Open Roads
  - Existing Closed Roads
  - Proposed Roads
  - 500-ft Contours



STIKINE AREA VICINITY MAP  
MAP AREA SHOWN IN ORANGE



\\projects\crane\_rowan\plots\docmaps\alt3.map  
alt3.map and alt3s.map! <3> 07/01/98

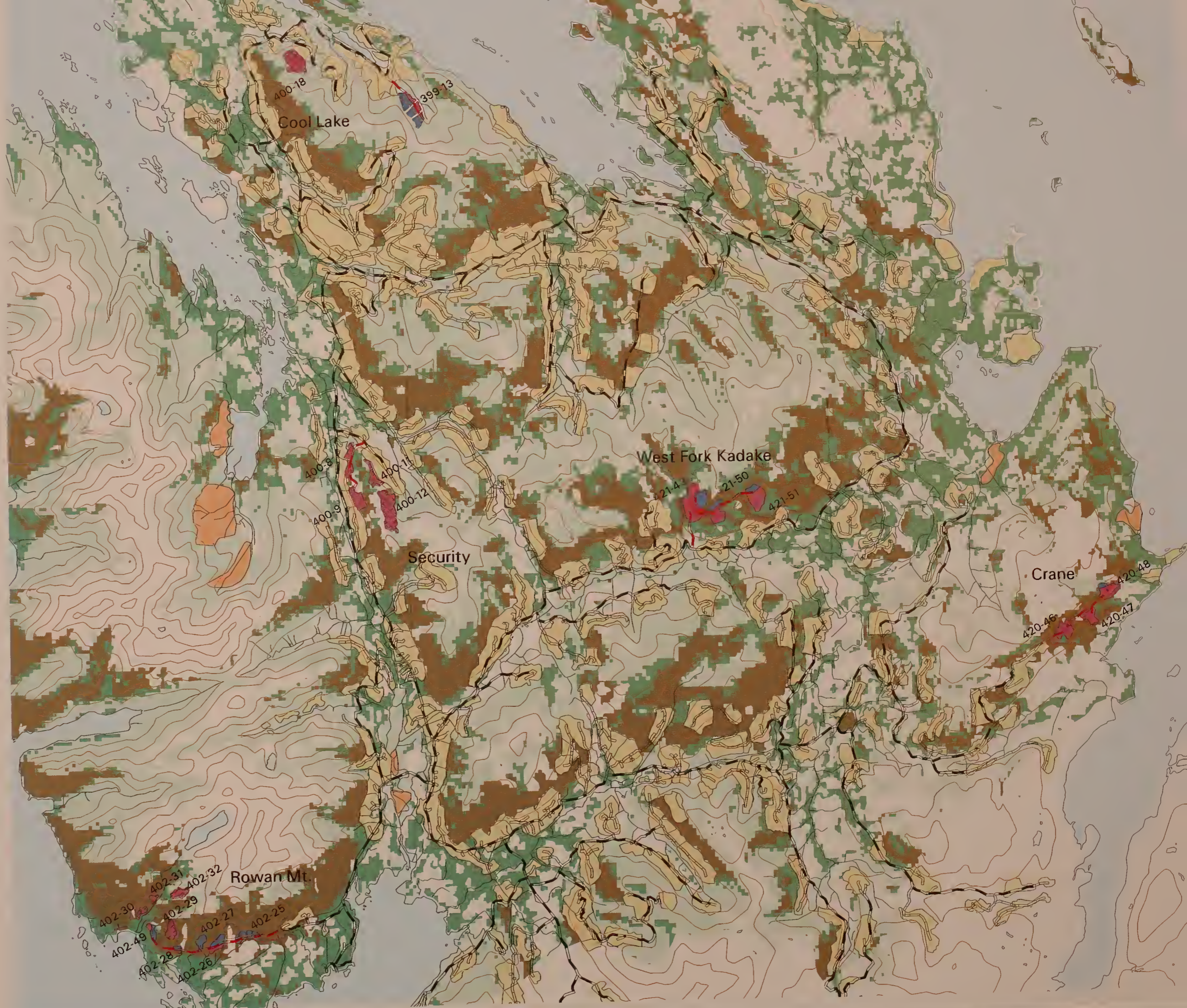


















Figure 2-13  
Alternative 4  
(Preferred)

Legend

-  Existing Partial Harvest
-  Existing Clearcut
- (Existing includes harvested and NEPA-approved prior to Crane/Rowan EIS)
-  Proposed Clearcut Harvest Units
-  Proposed Diameter Limit Harvest Units
-  Lakes and Salt Water

FOREST WIND DISTURBANCE PROBABILITY:

-  Low (Gap Phase Processes)
-  Moderate (Mixed Disturbance Processes)
-  High (Stand Replacement Processes)

-  Helicopter Yarding
-  Crane/Rowan Mt Project Area Boundary
-  Existing Open Roads
-  Existing Closed Roads
-  Proposed Roads
-  500-ft Contours



STIKINE AREA VICINITY MAP  
MAP AREA SHOWN IN ORANGE

0 7920 15840



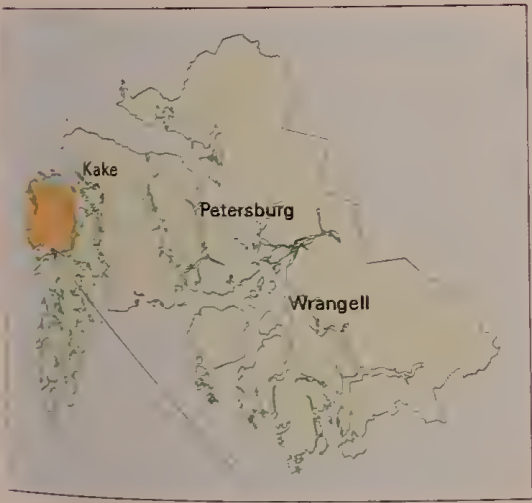
g:\projects\crane\_rowan\plots\docmaps\alt4.map  
a:\map\aml and allalts.aml <4> 07/01/98





Figure 2-14  
Alternative 5

- Legend
- Existing Partial Harvest
  - Existing Clearcut
  - (Existing includes harvested and NEPA-approved prior to Crane/Rowan EIS)
  - Proposed Clearcut Harvest Units
  - Proposed Diameter Limit Harvest Units
  - Lakes and Salt Water
- FOREST WIND DISTURBANCE PROBABILITY:
- Low (Gap Phase Processes)
  - Moderate (Mixed Disturbance Processes)
  - High (Stand Replacement Processes)
- Helicopter Yarding
  - Crane/Rowan Mt Project Area Boundary
  - Existing Open Roads
  - Existing Closed Roads
  - Proposed Roads
  - 500-ft Contours



STIKINE AREA VICINITY MAP  
MAP AREA SHOWN IN ORANGE



gis/projects/crane\_rowan/plots/docmaps/alt5.map  
altmap.aml and allalts.aml <5> 07/01/98





# **Chapter 3**

## **Affected Environment and Environmental Effects**

# Chapter 1

Introduction

1.1 The Nature of the Problem

1.2 The Scope of the Problem

1.3 The Objectives of the Study

# Chapter 3

## Setting

### Introduction

Climate, geology and disturbance agents are important factors in determining the ecological characteristics of any landscape. They determine characteristics including topography, soils, distribution of plant communities and the distribution and types of stream channels. These characteristics then influence the type and extent of resource management, whether it is for recreation, fisheries, timber production or any other resource.

Kuiu Island has a maritime climate, resulting from the moderating influence of the Pacific Ocean. In summer, this provides a cooling influence, while in winter, temperatures are warmer than would be expected for these latitudes. During the summer, temperatures are highest inland and lowest along the coast, while in winter the reverse is true. Rainfall is abundant throughout the year. There is no summer dry season. Storms with heavy rainfall and strong winds can occur year-round, but most commonly from September through November.

These infrequent but severe storms have caused massive blowdown of trees. On exposed south-facing slopes, the disturbance from windthrow has resulted in a mosaic pattern of forest stands of various ages corresponding to different storm events. Stands on more protected north aspects are most often-characteristic old growth stands, where disturbance is less severe.

We divided the Crane and Rowan Mountain project area into five logical groups of units based on their location within the project area. These are the Rowan Mountain, Crane, Security, West Fork Kadake, and Cool Lake unit areas.

### Rowan Mountain Units

The Rowan Mountain units are on the lower slope of Rowan Mountain, a steep south-facing mountain slope with a smooth, rounded alpine ecosystem. The elevation of Rowan Mountain is around 3,000 feet. Landslide tracts are a prominent part of this type of mountainslope. Muskegs and wetlands are not very common on Rowan Mountain, but can be found on the lower slope below the proposed units. Vegetation includes mountain hemlock forests on the upper slopes, western hemlock forests on the mid and lower slopes, and Sitka spruce and western hemlock/devils club forests in disturbed areas such as landslide chutes.

The proposed units are seen from Rowan Bay and Chatham Straits. The area is made up of many small watersheds with steep, bedrock streams. Fisheries downstream are limited to coho and resident trout, though some pink and chum salmon may be present a short distance up from saltwater. There are high numbers of deer and wolves as well as beaver and geese at lower elevations. There is also high marten habitat with large numbers of squirrels.

Potential for forest management is generally limited to the highly productive forest sites on the lower mountain slopes because the upper slopes are often too steep and isolated. The proposed units consist mainly of western hemlock forests with some spruce and cedar. This slope is currently not harvested but there are some units behind the Rowan Bay camp that have been sold.

### **Natural Disturbance Patterns**

Landslides and windthrow are the two most common causes of natural disturbance on Rowan Mountain. Landslides originate in the very steep upper and mid-slopes and flow downslope forming long narrow features on the landscape. Landslide chutes range from unvegetated areas less than 20 years old, to alder communities, to mature spruce forest about 300 years old.

The other prominent disturbance factor in this area is windthrow. The proposed units on Rowan Mountain are on a south-facing, wind prone slope on the outer coast of Kuiu Island that is subject to frequent catastrophic wind events. Winds often come southeast to southwest up Chatham Strait and hit the face of Rowan Mountain. Wind probability mapping (Kramer, 1997) indicates moderate to high probability of windthrow. Nearly all forest stands on this mountain slope are in the first three stages of stand development. True old-growth forests only occur on the gently sloping terrace between the bottom of the mountain and saltwater.

## **Crane Units**

The proposed Crane units are located on a southeast-facing slope on the West Side of Port Camden. The area consists of prominently benched hills typical of volcanic terrain. It is largely the result of glacially eroded volcanic flows. The hill slope is less than 1,500 feet in elevation. The forested slope is dominantly western hemlock and western hemlock-Alaska-cedar forest. Extensive muskegs and mixed conifer forests lie above and below the slope.

The proposed units are seen from parts of Port Camden. They are not actually in the Crane Creek watershed, but are beyond the existing harvest units in several small watersheds that flow into Port Camden. The small streams are influenced by easily erodible volcanic bedrock in the area. Fish use is limited to resident trout. There are relatively low numbers of deer, moose, wolves and bear. There is moderate marten habitat with low numbers of squirrels. Forest management activities need to proceed with due caution because of the unstable nature of the rock material.

### **Natural Disturbance Patterns**

Windthrow is the dominant forest disturbance agent in the vicinity of the Crane units. The area contains stands in the last three stand development stages. Winds often come from the south. Wind probability mapping (Kramer, 1997) indicates moderate to high probability of windthrow.

## **Security Units**

The proposed Security units are located in the Security Creek watershed at the upper end of a north-south valley that connects Rowan Bay to Security Bay. They are on well-rounded ridge less than 1,500 feet in elevation. The bedrock generally weathers to a silty or loamy texture with many sharp, angular rock fragments.

Portions of the units are seen from Security Bay. The Security Creek watershed is approximately 6,000 acres in size and is currently harvested at 23%. Most of the existing units are between 15 and 25 years old. The first three miles of the main stem of Security Creek are predominantly floodplain. The watershed contains nearly 10 miles of anadromous (Class I) stream with pink, chum and coho present. There are goshawks in and near the area. There are high numbers of bears, low deer use and moderate numbers of wolves. There are beavers in the lower elevations and moderate marten habitat with a moderate number of squirrels. There are large areas of productive western hemlock forests on the ridge.

### Natural Disturbance Patterns

Windthrow is the dominant forest disturbance agent in the vicinity of the proposed Security units. The units on the west side of the ridge are in a high to moderate wind probability zone, and the east facing units are in moderate to low probability (Kramer, 1997). Wind generated stands are common on south and west facing slopes. Old growth is dominant on north and east facing slopes and on sites topographically protected from strong storm winds. Winds generally funnel up the valley that connects Rowan and Security Bays.

## West Fork Kadake Units

The proposed West Fork Kadake units are located on a southfacing slope of a 1,500-foot hill in the upper west fork of Kadake Creek. The area generally consists of a long, forested hillslope. There are few muskegs in the area. The bedrock generally weathers to a silty or loamy texture with many sharp, angular rock fragments.

The proposed units are not seen from any major viewing areas. The west fork watershed is approximately 8,980 acres in size and is currently harvested at 17%. The existing units are between 8 and 27 years old. The whole Kadake Creek watershed is approximately 50 square miles in size and is currently harvested at 14%. The section of the west fork of Kadake Creek near the units is predominantly well-contained in bedrock. The main portion of Kadake Creek downstream has moderate floodplain development with some bedrock sections. The west fork of Kadake has approximately 17 miles of anadromous streams. Cohos use all of this while pink and chum-spawning habitat is limited to the lower floodplain sections. There is moderate habitat for moose and marten with a moderate number of squirrels. There is high black bear and low deer use. There are large areas of productive western hemlock forests on the slope.

### Natural Disturbance Patterns

Windthrow is the dominant forest disturbance agent in the vicinity of the proposed Kadake units. Both wind generated stands and old growth stands occur on this slope. These units are in a high to moderate probability area for windthrow (Kramer, 1997). Winds are mostly from the southwest in through Rowan Bay.

## Cool Lake Units

The proposed Cool Lake units are located on the West Side of Saginaw Bay. They are on the smooth, northeast-facing slope of a 2,000 foot hill. The bedrock generally weathers to a silty or loamy texture with many sharp, angular rock fragments.

The proposed units are seen from Saginaw Bay. They are in two different watersheds one of, which is limited to resident trout. The other is partially in the Dean Creek watershed, which is approximately 4,700 acres in size and is currently harvested at 28%. Most of the existing units are between 9 and 32 years old. There is a fish ladder that provides access for pinks, chums and cohos. There are low numbers of deer and high numbers of bear. There are beaver at lower elevations and moderate habitat for marten and squirrels. There are large areas of productive western hemlock forests on the slope.

### Natural Disturbance Patterns

Windthrow is the dominant forest disturbance agent in the vicinity of the proposed Crane units. Much of this slope is protected from wind and in an old growth condition. It lies in a low to moderate wind probability area (Kramer, 1997). However, because of the topographic position of the proposed units, they are largely wind-generated stands. Unit 400-18 is a wind-generated stand due to winds that come through the valley from Rowan to Security Bay and increase in turbulence as they wrap around the ridge. Unit 399-13 has some old growth and some wind generated areas from southeast wind.



# Habitat Conservation

## Definitions

**Biological Assessment** – A legally mandated requirement under the Endangered Species Act of 1968, to assess the affects of the Federal Action on Federally listed Threatened and Endangered Species.

**Biological Evaluation** – A legally mandated requirement under Forest Service Manual Direction to assess the affects of the Federal Action on Forest Service listed Sensitive Species.

**Biological Opinion** – A legal opinion from the US Fish and Wildlife Service or the National Marine Fisheries Service as to the affects of the listed Federal Action on Threatened and Endangered Species.

**Natural Range of Variability** – The statistical distribution of environmental conditions (e.g. density of deer over time).

**Endemic Mammals** – Restricted to a particular locality. For example, a particular species or subspecies may occur on only one or a few islands.

**Productive Old Growth (POG)** – Old growth forest capable of producing at least 20 cubic feet of wood fiber per acre per year, or having greater than 8,000 board feet per acre.

## Introduction

The Tongass National Forest provides habitat for 54 species of mammals (including the recently introduced elk on Etolin and Zarembo Islands), 231 species of birds, and five species of amphibians and reptiles. There are 18 species of marine mammals found in Southeast Alaska that depend on the ocean environment as well as upland habitat for prey species, additionally there are 45 birds and 3 amphibian or reptile species considered casual or accidental visitors to Southeast Alaska. Of these species, many are found on Kuiu Island.

There are many consumptive and non-consumptive uses for wildlife populations on Kuiu Island including sport, subsistence and commercial. Traditional life-styles and the remoteness makes the subsistence use of wildlife important to rural people in Southeast Alaska (USDA Forest Service, 1997e).

Other consumptive and non-consumptive use of wildlife also occurs. Commercial users include outfitter guides for recreational experiences such as kayaking or photography, or for hunting and fishing. Sport use is also an important activity. Federal and State agencies, chambers of commerce and schools throughout the state have educational activities built around wildlife values.

## Biological Diversity

Biological diversity within an ecosystem can be described in terms of three components: composition, structure, and function. Composition refers to the numbers and types of species, plant communities, and smaller ecosystems within an area. Structure refers to the arrangement of these communities or ecosystems across a landscape (how they are connected). Function refers to the interactions and influences between plant and animal species within an area (how each species uses its environment) and to natural processes of change or disturbance (wind, aging, etc.).

Through the implementation of the Forest Plan Standards and Guidelines and land allocations (See TLMP, Old Growth Habitat LUD pages 3-88 to 3-99, Subsistence LUD pages 4-93 to 4-94, and the Wildlife LUD pages 4-125 to 4-130) we will maintain the biological diversity within the project area. In this document we present alternatives that manage the vegetation patterns at the landscape and stand level that are, to varying degrees, consistent with natural disturbance processes (e.g. windthrow).

The old growth habitat conservation strategy in the Forest Plan resulted from response to wildlife viability issues. Due largely to uncertainty, the Forest Plan does not, however, represent a “no risk” conservation strategy; rather it represents a balance of wildlife conservation measures that consider the best available scientific information and reflects an acceptable level of risk for continued species viability.

### Reserves and Management within the Matrix.

The conservation of biological diversity requires two strategies for addressing both individual species as well as entire ecosystems (Marcot et al, 1994). The traditional species-by-species approach is important for featured Management Indicator Species (MIS), sensitive or rare species. This strategy, often called the “fine filter” approach, is discussed and implemented in the Forest Plan standards and guidelines and land allocations. Goshawk and eagle nest buffers are example of fine filter habitat considerations.

The second strategy is the course filter (Hunter, 1990). This approach focuses on conserving the entire ecosystem by facilitating the maintenance of a functional and interconnected natural forest mosaic.

In part, this strategy relies on a system of reserves. These reserves are blocks of intact, largely undisturbed habitats of the appropriate size, spacing, and composition to ensure the maintenance of viable, well-distributed populations. The habitat conservation area (HCA) network used for the conservation of spotted owl habitat in the Pacific Northwest is a classic example (Thomas et al., 1990). The Forest Plan used a similar strategy for maintaining habitat for biodiversity and viable wildlife populations across the Tongass. The Tongass scheme includes a system of large, medium and small old growth reserves (OGRs) which often include withdrawn areas such as wilderness, coastal beach fringe and riparian buffers for landscape connectivity, along with standards and guidelines. These OGRs are illustrated on the alternative maps.

The coarse filter approach also relies on using silvicultural practices outside the reserve system (the matrix) to provide for biodiversity, such as retaining snags and green trees within harvest units. The scientists reviewing the Forest Plan revision recommended enhancing landscape connectivity and increasing levels of leave trees within units (selection harvest techniques) and to manage human disturbance of the land similar to natural disturbance regimes (TLMP, Appendix N, p. 22, 1997).

Implicit in this matrix management approach is the use of different silvicultural systems and extended rotations (the time period between two harvests of the same unit) to achieve multiple age classes within and among managed stands. Such practices are necessary to perpetuate the ecological structures and processes of naturally occurring mature forest.

By adopting a strategy that establishes reserves and manages the matrix to maintain biodiversity, we can avoid the limitations of using either component individually (Thomas, et. al., 1990). As a complement to reserves, matrix management serves at least three important roles:

- Provide habitat at smaller spatial scales,
- Increase the effectiveness of the reserves, and
- Maintain landscape connectivity.

Our old growth forest habitat strategy has three primary components:

1. A network of small, medium and large old growth habitat reserves,
2. A forest-wide system of habitat protected in other non-development LUDs,
3. Forest Plan Standards and Guidelines that protect important habitat elements and provide for habitat connectivity such as beach, riparian and estuary.

The Forest Service identified and mapped small reserves in the Forest Plan to establish the Old Growth Land Use Designation areas. Small reserves serve two principal functions:

- As corridors for habitat connectivity among large and medium reserves;
- As habitat for species such as flying squirrels that are less able to disperse among larger reserves.

The small old growth reserve in Saginaw Bay (VCU 399) could be affected by Gunnuk Creek land exchange. If this land selection is submitted to the BLM for conveyance, the Forest Service in cooperation with the U. S. Fish and Wildlife Service and the Alaska Department of Fish and Game will evaluate the functionality of the remaining viability strategy. If a change in land allocations is deemed necessary to achieve the Forest Plan old growth strategy standards and guidelines, the Forest Plan will be amended to ensure the old growth conservation strategy is maintained.

All alternatives meet or exceed the Forest Plan standards and guidelines to conserve biodiversity (form, function and composition) within the sale area.

## Habitat Connectivity

## Habitat Descriptions

### Wildlife Habitats

Important wildlife habitats inventoried for the Tongass Land Management Plan includes beach fringe, estuary fringe, riparian and old growth forest blocks. This inventory came from GIS computer maps. We completed ground verification in areas where questions of habitat suitability occurred.

#### Alpine/Sub-Alpine

Sub-alpine habitat is the upper edge of forested areas (within 1,000 feet) adjoining alpine areas. This habitat is important summer range for deer and bears. It is also used by goshawks and wolves to hunt prey species. No alpine/sub-alpine habitat is affected in the analysis area because no timber harvest or roading occurs there, and it would be essentially unaffected by any alternative. The alpine/sub-alpine habitat on the project area is not a limiting factor to any of the MIS species.

#### Beach Fringe

Beach fringe is defined as the area within 1000 feet of the mean high tide line. This transition zone receives heavy use by many species (for example: black bear; otter; mink, bald eagle; marten; black-tailed deer; Arctic and American peregrine falcons; osprey; numerous duck species and Vancouver Canada geese) during at least some of the year. No additional acres of beach fringe will be impacted in any alternative.

#### Estuary Fringe

Bears, waterfowl, furbearers and eagles are all primary users of the estuarine fringe habitat. Although timber harvest activities have been minimal within the actual estuary habitat, it is the timbered zone that borders estuary habitat that is evaluated here. The Forest Plan identified a 1,000-foot zone around estuarine areas for protection. The forested estuary is similar to beach fringe but due to species diversity it has a greater value to wildlife; especially black bears, river otters, peregrine falcons and waterfowl. No additional acres of estuary fringe will be impacted in any alternative.

#### Forested Uplands

Forested habitat includes all areas with forest cover. Many wildlife species, including those dependent on the existing mosaic of forest types, make use these forested uplands.

We hypothesize that alternatives that maintain the naturally occurring forest mosaic minimize the effects on habitat for the deer, and most of the wildlife species living in the forests of Kuiu Island. Our challenge is to describe this natural mosaic and prescribe alternative harvest regimes that perpetuate it. This will allow us to maintain the timber industry of Southeast Alaska as well as the wildlife diversity that occur here.

Data collected indicates that catastrophic windstorms occur every 110 to 150 years in Southeast Alaska. This can range from individual trees blowing down to an entire stand (hundreds of acres). (Oliver and Larson, 1996) defined stand development stages following a catastrophic disturbance as:

1. Stand Initiation – The stand initiation stage begins after large-scale natural or human induced disturbance. The former overstory is gone and a new stand begins to grow. This stage is characterized by a wide variety of plant species and continues until new, complete tree canopy forms and begins to shade out the understory. This generally occurs in 25 –35 years (Alaback, 1982).

- 2. Stem Exclusion – The stem exclusion stage follows and is characterized by high tree mortality. Trees die as they get crowded out and regeneration is precluded because the thick, new canopy restricts growing space and light. There are few understory plants because of the lack of light on the forest floor. Our field observations suggest this stage lasts about 100 years on most sites.
- 3. Understory Reinitiation – The canopy begins to open up as trees mature and die for various reasons. As space and light become available, understory plants appear on the forest floor, and new trees establish and grow. The length of this stage varies greatly. Field data collected on Kuiu Island suggests this stand stage typically persist for 150 to 250 years with a few examples reaching 500 years or more. Depending on the frequency of major storms, many stands on exposed slopes never progress beyond this stage.
- 4. Old Growth<sup>3</sup> – The old growth stage appears when the stand has many small groups or individual trees of different ages (Oliver and Larson, 1996). Distinct age classes are not present. Stand structure characteristics traditionally associated with old growth exist, including large and deformed trees with heavy and craggy limbs, standing snags, multiple canopy layers, and large dead wood accumulation on the forest floor and in streams, etc. Death of one or a few overstory trees permits the growth of small patches of young trees. This process is called gap phase dynamics (Oliver and Larson, 1996). Field data suggests typical times to reach the old growth stage are 250 to 600 years.

Much of the forest on the project area does not meet the process definition of old growth. Measured stand ages varied from recent (within the past year) to over 500 years. As a result of previous storms, the most common forest structure type on south-facing slopes is probably the understory reinitiation stage. The stem exclusion stage is relatively rare on the project area. Past harvest activities are still in the stand initiation stage. The old growth stage probably only occurs on about 35 percent of the forested acres of Kuiu Island (Nowacki and Kramer, 1997).

## Management Indicator Species

The Forest Plan chose several management indicator species' (MIS) to assess the health of wildlife populations on the Tongass National Forest. Some of the MIS response can be used to predict the likely response of other species with similar habitat requirements to land management activities.

We chose two MIS species for this project and another important group is also discussed. These are:

- Sitka black-tailed deer
- Marten
- Endemic terrestrial mammals.

Several other species from the Regional Forester's Sensitive Species List are discussed in the Biological Evaluation. These are the Alexander Archipelago wolf, Queen Charlotte goshawk, osprey, Peale's peregrine falcon, and the Trumpeter swan.

---

<sup>3</sup>The term 'old growth' has been used in many different ways. In this document, we refer to old growth as it relates to the stand development stage defined above. Others to describe esthetics, wildlife habitat, and the forest of southeast Alaska as a whole, etc have also used the term. It can also refer to stands with specific structural characteristics regardless of the processes that led to those structures (USDA Forest Service, 1992a).

### Sitka Black-tailed Deer

The Sitka Black-tailed deer is an important game animal to people in Southeast Alaska. It is a prime subsistence, sport hunting and recreational viewing resource. Maintaining sufficient habitat to ensure huntable populations of this species is an objective for the Forest Service. During winters with snow accumulations, deer are generally found on southern aspects at low to moderate elevations in multi-canopied forests (forb and blueberry in the understory). Figure 3-1 illustrates high, medium and low winter deer habitat values.

Deer populations are dynamic and respond to predation and winter weather. Deep snow accumulations make forage unavailable to deer, particularly in young growth and sparse canopy stands. Every twenty to forty years' severe winter storms kill large numbers of deer. On the Stikine Area, a series of severe deep snow winters resulted in a deer herd die-off during 1968 to 1972. It took nearly 20 years for deer numbers to recover to a sufficient level to allow hunting to resume. Between 1972 and the early 1980s it was uncommon for Forest Service personnel to see deer sign in the project area. In 1992, the population had recovered enough to allow a hunting season with a two antlered-deer tag limit.

Figure 3-1  
Deer Winter Habitat  
Suitability

- Legend
- DEER WINTER HABITAT SUITABILITY:
- Low: HSI > 0 and < .3
  - Medium: HSI >= .3 and < .6
  - High: HSI >= .6
- Proposed Harvest Units, All Alternatives
- Existing Managed Stands  
(Existing includes harvested and NEPA-approved prior to Crane/Rowan EIS)
- Existing Open Roads
- Existing Closed Roads  
(Existing includes built and NEPA-approved prior to Crane/Rowan EIS)
- Crane/Rowan Opportunity Roads
- Shoreline, Lakes, Streams
- Study Area Boundary



STIKINE AREA VICINITY MAP  
MAP AREA SHOWN IN ORANGE





Forest stands that are in the stand initiation or stem exclusion stages do not generally contribute to deer winter habitat when snow accumulation levels are high. As stands reach the understory reinitiation stage, around 100 years of age, cover and forage that are important for deer winter habitat begin to increase. The units that are proposed for partial harvest will more closely resemble the understory reinitiation stage and may maintain some of their value as deer winter habitat.

### Effects of Alternatives

Effects of the alternatives on habitat capability were analyzed by using the Interagency Deer Model (TLMP 1997), used in the Forest Plan. The model uses elevation, aspect, amount of snow, and stand type to estimate how valuable an area is for deer winter habitat, which can be a limiting factor. Declines in deer habitat quality also affect numbers of the Alexander Archipelago wolf that preys on deer, as well as subsistence/sport hunting of deer.

For this analysis, deer winter range is determined as Productive Old Growth (POG). Table 3-1 displays the acreage harvested by harvest method, by alternative, and Table 3-2 displays the percent reduction in "Productive Old Growth" island-wide and project area-wide. Table 3-3 displays the percent of deer habitat capability remaining on the project area by the year 2030. These tables are used to evaluate the alternative's affects on deer habitat capability. Stands that receive the partial harvest prescription, where 50 percent of the overstory is retained, were estimated to retain 50 percent of their old growth habitat capability.

**Table 3-1** Effects of Proposed Harvest by Alternative on Productive Old Growth (POG) by Prescription.

	ALT 1	ALT 2		ALT 3		ALT 4		ALT 5	
Prescription	No Harvest	CC <sup>4</sup>	DL <sup>5</sup>	CC	DL	CC	DL	CC	DL
Acreage of POG Harvested by Alternative		738 ac	0 ac	210 ac	528ac	159ac	897ac	548 ac	164ac
Percent By Harvest Prescription		100%	0	28%	72%	15%	85%	77%	23%

<sup>4</sup> Clear-cut prescription leaving 10% overstory in each unit.

<sup>5</sup> Diameter Limit prescription leaving 50% overstory in each unit.

**Table 3-2** Amount POG Remaining by Alternative on Island-wide and Project Area Scale.

	Percent POG Currently Available	Percent POG Remaining After Harvest Alternative 2	Percent POG Remaining After Harvest Alternative 3	Percent POG Remaining After Harvest Alternative 4	Percent POG Remaining After Harvest Alternative 5
Percent Remaining POG <sup>6</sup> – Island-wide	92.69%	92.46%	92.54%	92.50%	92.49%
Percent Remaining POG <sup>7</sup> – Project area	83.51%	82.88%	83.10%	82.99%	82.97%

**Table 3-3** Deer Habitat Capability in 1954, 1995 and 2030 by Alternative.

Habitat capability in 1954	Habitat capability in 1997	Habitat capability by year 2030				
		Alt1	Alt2	Alt3	Alt4	Alt5
100%	82%	81%	80%	80%	80%	80%

## Effects on Sitka Black-tail Deer Habitat

### Alternative 1

Alternative 1 will analyze the effects of having no timber sale or road construction in the Crane and Rowan Mountain project area. This alternative is provided so that you can see the changes that the other alternatives have on the social, physical and biological environment. This alternative is the most responsive to maintaining current wildlife habitat. It would not contribute to local employment or income and would not move the project area toward the desired future condition that is stated in the Forest Plan (TLMP, 1997).

Deer habitat capability will decline in all alternatives. The Interagency Deer Model (TLMP 1997 Version 7.0.1) predicts that habitat values will decline another one-percent from existing levels. This decline is primarily due to the managed stands presently in the stand initiation stage moving into the stem exclusion stage. Cumulatively, the project area is expected to have 55 percent of the habitat remaining at year 2095 according to the Forest Plan.

<sup>6</sup> Island-wide POG = 326,318 acres based on 1954 values.

<sup>7</sup> Project area POG = 117,750 acres based on 1954 values.

### Alternative 2

Alternative 2 is the proposed action that would harvest approximately 23 MMBF of timber. It would offer the second most volume to potential large and small operators and provides the best economic return of all the alternatives. All of this harvest would be clear-cut<sup>8</sup> and would use cable or helicopter yarding. Approximately 6.59 miles of specified road and 2.4 miles of temporary road would be constructed to access some of this timber and provide infrastructure for future sales. All new roads would be closed following harvest to protect wildlife values. This and all other action alternatives will use the existing Rowan Bay LTF for log barging. This alternative serves as the basis of comparison for all other alternatives.

728 acres will be harvested by clear-cut methods. The deer model (TLMP 1997 Version 7.0.1) predicts that 80 percent of the habitat will be remaining by year 2030. Cumulatively, this alternative design will meet the Forest Plan estimate of 55 percent of the habitat remaining in WAA 5012 by the year 2095.

### Alternative 3

Alternative 3 responds primarily to public concerns surrounding wildlife habitat, scenery and watershed resources. Harvesting some units as partial cuts rather than clear-cuts would reduce habitat fragmentation, watershed and visual impacts. This alternative would harvest approximately 17 MMBF of timber. Approximately 6.59 miles of specified road and 2.4 miles of temporary road would be constructed to access some of this timber and provide infrastructure for future sales. All new roads would be closed following harvest to protect wildlife values. This and all other action alternatives will use the existing Rowan Bay LTF for log barging.

This alternative will harvest 728 acres by using 210 acres of clear-cuts and 528 acres of diameter limit cut to maintain the naturally occurring disturbance patterns. This alternative will have 80% of the habitat remaining in the year 2030. The diameter limit resembles the understory reinitiation stage and therefore helps maintain the value of the winter habitat. We predict that this harvest scheme will retain at least 50 percent more of the habitat than the Forest Plan prediction of 55% by the year 2095.

### Alternative 4

Alternative 4 responds to the timber economics, wildlife habitat and fragmentation, scenery and watershed issues. Alternative 4 comprises all of the units in Alternative 2 except for two. One clear-cut unit in the Security Creek watershed is dropped to lower the risk to watershed resources. On Rowan Mountain, one clear-cut unit is dropped and other partial harvest units enlarged or added to better maintain natural disturbance patterns. Approximately 24 MMBF will be harvested by this alternative, 6.59 miles of specified road and 1.4 miles of temporary road would be constructed to access some of this timber and provide infrastructure for future sales. All new roads would be closed following harvest to protect wildlife values. This and all other action alternatives will use the existing Rowan Bay LTF for log barging.

Alternative 4 harvests 1056 acres and converts the most acres by clear-cutting 159 acres and by cutting 897 acres using diameter limit. This alternative will have 80 percent of the habitat remaining at year 2030 and we expect this alternative scheme, even though it harvests more acres, to reduce the expected Forest Plan harvest level by 50% below the 55 percent prediction in the year 2095.

---

<sup>8</sup> Clear-cutting is an even-aged silvicultural system used to manage forestlands. All clear-cut systems planned in this project will include retention of wildlife legacy trees.

### Alternative 5

Alternative 5 responds primarily to public concerns surrounding watershed resources and timber economics. This alternative drops all harvest units from the Security Creek watershed in order to lower the risk to the watershed resources. Dropping these units would also decrease fragmentation and impacts to the visual resource in this watershed. This alternative then uses all the other clear-cut units from Alternative 2 and adds units 402-50 and 402-51 on Rowan Mountain to provide more timber volume. This alternative would harvest approximately 21 MMBF of timber. Approximately 6.59 miles of specified road and 1.5 miles of temporary road would be constructed to access some of this timber and provide infrastructure for future sales. All new roads would be closed following harvest to protect wildlife values. This and all other action alternatives will use the existing Rowan Bay LTF for log barging.

This alternative will have similar effects as Alternative 2 by harvesting 712 acres. All units in the Security Creek watershed are dropped, while several partial harvest units in the Rowan Mountain area are added. The Interagency deer model (TLMP 1997 Version 7.0.1) predicts that 80% of the habitat will be remaining in the year 2030. We expect the predicted 55 percent remaining habitat from the Forest Plan to be accomplished using this alternative scheme.

### Marten

Extensive mature forests are the mainstay of marten populations in the Pacific Northwest states. These habitats provide many den sites and an abundant prey base for martens (Suring et. al., 1988); (Meslow et. al., 1981). Marten is a member of the weasel family that depend on mature forests with snags and downed logs for denning and prey habitat. Beach fringe and riparian areas (Soutiere, 1979), are important for these animals. They can be sensitive to over-exploitation by trapping.

Snags provide important den sites to martens for resting activities in both winter and summer (Spencer, 1987). They use the tops of broken snags as resting sites in the summer and cavities in summer and winter. They prefer snags that range from 14 to 49-inch diameter at breast height (dbh.) (Campbell, 1979; Spencer, 1987). Marten are non-social carnivores that maintain large home ranges. The species is native to Kupreanof, Mitkof and Kuiu islands, but was introduced to other Southeast Alaskan islands (Flynn and Blundell, 1992). The limited natural distribution of marten in the archipelago indicates a limited dispersal potential due to natural water barriers (Flynn and Blundell, 1992). These barriers may not occur among Mitkof, Kupreanof and Kuiu Islands.

Marten viability has been provided for on Kuiu Island. All alternatives meet the Forest Plan Standards and Guidelines. Alternatives 3, 4, and 5 will exceed the Forest Plan Standards and Guidelines by using the partial harvest.

### Endemic Terrestrial Mammals

Forest Plan standards and guidelines for endemic terrestrial mammals require surveys on islands smaller than 50,000 acres in size. Kuiu Island is approximately 500,000 acres in size. No terrestrial mammals are known to be endemic only to Kuiu Island.

There are currently populations of flying squirrels on Mitkof Island, and probably Kupreanof Island (DeGayner and Hastings, 1996). It is not known whether the flying squirrel exists on Kuiu, but no sightings have been reported.

Endemic terrestrial mammals were also a topic of discussion at the consultation meeting held October 10, 1997 with the interagency implementation team consisting of NMFS, USF&WS, EPA, ADGC, ADEC, and ADF&G (Transition meeting, 1997). No concerns relative to this project regarding endemic terrestrial mammals were noted.

## Consistency of Alternatives in Relation to Disturbance Ecology

We have found that for productive western hemlock and western hemlock/Sitka spruce stands, the progression to the old growth stage usually takes place in wind sheltered areas. These occur mostly on north facing slopes of the project area, since the strongest winds come from the south. In contrast, stands occurring on wind-exposed landscapes seldom reach old growth as storm intervals seem to be frequent enough to restrict forests to the first three stages of development (Kramer, 1997).

On these wind-exposed landscapes, a variety of successional pathways exist (Nowacki and Kramer, 1997). A common progression starts with a partial disturbance. Over time, the stand moves into the understory reinitiation stage. In this stage two distinct age classes are present in the overstory: the individuals left after the stand initiating storm; and the trees that started growing right after the storm. Additionally, there is a third age class beginning to develop in the understory. At this point due to the frequency of major storms, the stand is partially disturbed again. If all the oldest trees blow over, the stand continues to develop with two age classes. If not, the stand structure becomes more complex, now containing three age classes. Many stands never develop more than three age classes, as the oldest age class continually blows over in major storm events.

We propose to mimic natural disturbance on two levels: the stand level and the landscape level. At the stand level, we will mimic the pattern of repeated partial disturbance as described above by creating harvest units with two or three age classes of trees. These units will closely resemble the understory reinitiation stage following partial disturbance. In addition, we will mimic the complete stand-replacing event by creating units with few trees left, moving them into the stand initiation stage. At the landscape level, we will maintain the natural patchy pattern of stands existing after windthrow events that leave some stands completely blown down while other nearby stands are only partially blown over. We propose to do this by intermixing units that closely resemble the understory reinitiation stage right after harvest with units that are moved into the stand initiation stage.

The tools that are available for use in maintaining natural disturbance processes at the stand level are discussed in the Forest Plan (Appendix G). This appendix lists three groupings of silvicultural systems (ways of managing forests for clearly defined goals (Smith, 1962)). They are even-aged, two-aged and uneven-aged systems. The silvicultural system applied to each proposed unit is listed on the individual unit cards found in Appendix A of this document. There is also a discussion of which stand development stage the unit is currently in, the desired future condition of the unit, and whether the unit is expected to in an even-aged, two-aged or uneven-aged condition over time.

### Reserve Trees

Another important habitat components of the forest are snags for cavity nesting birds and mammals. The clear-cut system will retain 10 percent of the overstory trees; the two-aged management system will retain between 50 and 60 percent of the overstory trees in the unit. These trees will provide biological legacies and large woody debris for future stands.

Table 2-1 displays the amount of harvest in each unit by alternative. We are prescribing different harvest strategies in each alternative. Recent cruise data from the project areas shows that the diameter limit will retain approximately 50 to 60 percent of the overstory canopy. This will range from as little as 30 percent to as much as 80 percent remaining canopy due to the natural pattern found in our forest types. In addition, we will retain one larger spruce tree every 10 acres as a food source for the red squirrel and to insure a biological legacy.

Alternatives 3 and 4 will maintain legacy trees in units through the prescriptive measures described on the unit cards. Alternative 2 and 5 will maintain buffers of trees for snag recruitment along streamcourses and unit boundaries as well as the non-merchandisable trees left standing within the unit.

## Effects of Alternatives by Area

The information and data included in the previous sections provide the basis for evaluating effects of the proposed alternatives on wildlife habitat and species distribution. Effects are projected not only for the duration of this project, but for the reasonable foreseeable future. The analysis is conducted on three spatially different levels for a better understanding and comparison. These levels are:

- The Stand Level
- The Sale Area Level
- The Island Wide or Ecosystem Level.

### Cool Lake Units

The proposed Cool Lake units are located on the West Side of Saginaw Bay. They are on the smooth, northeast-facing slope of a 2,000 foot hill. At the "Stand Level" both are connected to the Medium Old Growth Reserve in VCU 401 and to the Small Old Growth Reserve located in the Straight Creek by the Riparian Stream corridors and the Beach Fringe. At the "Sale Area Level" they connect through the Beach Fringe, Riparian Stream and Kadake Creek Wild and Scenic River corridors to the Medium Old Growth Reserve at Kadake Creek. They connect through the Medium Old Growth Reserves in VCUs 401 and 420 to the other Small Old Growth Reserves in VCUs 402 and 419. This, in turn, ties into the Large Old Growth Reserve in the Tebenkof Wilderness Area and thus to the remainder of the island. See the enclosed map for better details and ideas of wildlife movement patterns.

The U.S. Fish and Wildlife Service has expressed concern about the connectivity of the Old Growth Reserve (OGR) in VCU 399 (Transition meeting, 1997). This particular reserve meets the design criteria for OGRs but because of the geologic character of the area (high elevation), it does not readily connect to the southern VCUs. There is one pass over the mountains to the south that is 1000 feet in elevation, another passage along the beach via the beach fringe and a third along the stream corridor to the east. All three will be maintained for the duration of these sales and will not be impacted. We do not plan further units in these areas for the foreseeable future. All new roads constructed will be closed following harvest activities to protect wildlife values.

**Table 3-4** Summarized effects of Cool Lake Units by Alternative

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Landscape Design	NC <sup>9</sup>	CC=93ac DL=0ac	CC=79ac DL=14ac	CC=50ac CL=14ac	CC=64ac DL=0ac
Within Stand Structure	NC	CC=93ac 10% retained in unit. DL=0ac	CC=79ac 10% retained in unit. DL=14 ac 50% retained in unit.	CC=50ac 10% retained in unit. DL=14ac 50% retained in unit.	CC=64ac 10% retained in unit. DL=0ac
Wildlife Corridors	NC	Maintained OGR connectivity to VCU 399	Maintained OGR connectivity to VCU 399	Maintained OGR connectivity to VCU 399	Maintained OGR connectivity to VCU 399
Road Objectives	NC	3.14 miles of roads closed for wildlife value	3.14 miles of roads closed for wildlife value	3.14 miles of roads closed for wildlife value	3.14 miles of roads closed for wildlife value

The proposed units are in two different watersheds. One unit is in the 4,700 acres Dean Creek watershed that is currently harvested at 28%. Most of the existing units are between 9 and 32 years old. Pellet transects run by the Forest Service in conjunction with the Alaska Department of Fish and Game show low deer populations in the Security Bay area. Black bear populations are high in the Dean Creek, Security Bay area. There are high beaver populations at lower elevations with moderate habitat for marten and red squirrels. There are large areas of productive western hemlock forests on the slope.

#### Natural Disturbance Patterns

Windthrow is the dominant forest disturbance agent in the vicinity of the proposed units. Much of this slope is protected from wind and in an old growth condition. It lies in a low to moderate wind probability area (Kramer, 1997). However, because of the topographic position of the proposed units, they are largely wind-generated stands. Unit 400-18 is a wind-generated stand due to winds that come through the valley from Rowan to Security Bay and increase in turbulence as they wrap around the ridge. Unit 399-13 has some old growth and some wind generated areas from southeast wind.

#### Action Alternatives:

Both units are treated the same. In Alternatives 2 and 5 the clear-cut prescription is used and 10 percent of the overstory will be retained. Alternatives 3 and 4 use the diameter limit cut that remove 50 percent of the canopy cover.

<sup>9</sup> NC means No Cut – Unit is not harvested in this Alternative.

## Security Units

The proposed Security units are on well-rounded ridge less than 1,500 feet in elevation. At the "Stand Level" all are connected to the Medium Old Growth Reserve in VCU 401 through the Wild and Scenic River corridor at Fall Dog Creek and the Beach Fringe. At the "Sale Area Level" they connect through the Beach Fringe, Riparian Stream and the Small Old Growth Reserve at Rowan Creek. They connect through this Small Old Growth Reserve in VCUs 402 and the Medium Old Growth Reserve in VCU 403 which ties into the Large Old Growth Reserve in the Tebenkof Wilderness Area and thus to the remainder of the island. See the enclosed map for better details and ideas of wildlife movement patterns.

**Table 3-5 Summarized Effects of Security Units by Alternative**

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Landscape Design	NC	CC=197ac DL=0ac	CC=0ac DL=197ac	CC=0ac DL=425ac	CC=59ac DL=0ac
Within Stand Structure	NC	CC=197ac 10% retained in unit. DL=0ac	CC=0ac DL=197ac 50% retained in unit.	CC=0ac DL=425ac 50% retained in unit.	CC=59ac 10% retained in unit. DL=0ac
Wildlife Corridors	NC	Maintained corridor to medium OGR and pass to Rowan Bay	Maintained corridor to medium OGR and pass to Rowan Bay	Maintained corridor to medium OGR and pass to Rowan Bay	Maintained corridor to medium OGR and pass to Rowan Bay
Road Objectives	NC	1.96 miles of roads closed for wildlife value.	1.96 miles of roads closed for wildlife value.	1.03 miles of roads closed for wildlife value.	1.03 miles of roads closed for wildlife value.

The Security Creek watershed is approximately 6,000 acres in size and is currently harvested at 23%. Most of the existing units are between 15 and 25 years old. In Security Bay there are high numbers of bears, low deer use and a moderate numbers of wolves. There are numerous beaver dams in Dean Creek and at lower elevations. Marten habitat is moderate with a moderate number of red squirrels for a food source for marten and goshawks. A goshawk nest site is just to the south of this area. The nest has been abandoned for two years but goshawks were noted in the vicinity this year, however, no nest site was located. Another pair, which moved from Prince of Wales Island, has built a nest on the western shore of Security Bay in the medium OGR. There are large areas of productive western hemlock forests on the ridge. All new roads constructed will be closed following harvest activities to protect wildlife values.

### Natural Disturbance Patterns

Windthrow is the dominant forest disturbance agent in the vicinity of the proposed Security units. The units on the west side of the ridge are in a high to moderate wind probability zone, and the east facing units are in moderate to low probability (Kramer, 1997.) Wind generated stands are common on south and west facing slopes. Old growth is dominant on north and east facing slopes and on sites topographically protected from strong storm winds. Winds generally funnel up the valley that connects Rowan and Security Bays. Some of the areas

within the proposed units are old growth in nature, the diameter limit should allow the areas to return to an uneven-aged character as individual trees blow over in the future. This area should return to a condition similar to what is currently there by the end of the rotation.

**Alternative 2:**

Unit 400-22 is not harvested in this alternative; all other units are harvest using an even-aged system.

**Alternatives 3:**

Alternative 3 cuts 29 acres in unit 400-8 using an even-aged harvest system. Unit 400-13 is not harvested in this alternative. Unit 400-9 cuts 33 acres, 400-11 removes 26 acres, 400-12 harvests 79 acres and 400-18 cuts 59 acres using the diameter limit prescription that retains 50 percent of the tree crown cover.

**Alternative 4:**

All units' are harvested using the diameter limit that retains 50 percent of the tree crown cover. Unit 400-8 is not harvested, unit 400-9 removes 33 acres, 400-11 cuts 26 acres, 400-12 harvests 79 acres and 400-22 cuts 228 acres. Each of these units will retain from 50 to 60 percent of the overstory vegetation following harvest.

**Alternative 5:**

Only unit 400-18 is cut in this alternative using an even-aged harvest system to remove 59 acres.

## **Rowan Mountain Units**

The Rowan Mountain units are on the lower slope of Rowan Mountain, a steep south-facing mountain slope with a smooth, rounded alpine ecosystem. The elevation of Rowan Mountain is around 3,000 feet. Landslide tracts are a prominent part of this type of mountainslope. Muskegs and wetlands are not very common on Rowan Mountain, but can be found on the lower slope below the proposed units. Vegetation includes mountain hemlock forests on the upper slopes, western hemlock forests on the mid and lower slopes, and Sitka spruce and western hemlock/devils club forests in landslide chutes. At the "Stand Level" all are connected to the Medium Old Growth Reserve in VCU 401 through the alpine and the Beach Fringe. At the "Sale Area Level" they connect through the Beach Fringe, Riparian Stream and the Small Old Growth Reserve at Rowan Creek. They connect through this Small Old Growth Reserve in VCUs 402 and the Medium Old Growth Reserve in VCU 403 which ties into the Large Old Growth Reserve in the Tebenkof Wilderness Area and thus to the remainder of the island. See Figure 3-4 for details on wildlife habitat connectivity.

**Table 3-6 Summarized Effects of Rowan Mountain Units by Alternative**

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Landscape Design	NC	CC=148ac DL=0ac	CC=69ac DL=79ac	CC=37ac CL=220ac	CC=148ac DL=141ac
Within Stand Structure	NC	CC=148ac 10% retained in unit. DL=0ac	CC=69ac 10% retained in unit. DL=79ac 50% retained in unit.	CC=37ac 10% retained in unit. DL=220ac 50% retained in unit.	CC=148 ac 10% retained in unit. DL=141ac 50% retained in unit.
Wildlife Corridors	NC	Maintain beach/alpine habitat corridors.	Maintain beach/alpine habitat corridors.	Maintain beach/alpine habitat corridors.	Maintain beach/alpine habitat corridors.
Road Objectives	NC	2.48 miles of roads closed for wildlife value.	2.48 miles of roads closed for wildlife value.	2.4 miles of roads closed for wildlife value.	2.48 miles of roads closed for wildlife value.

The proposed units are in small watersheds with steep, bedrock streams. There are high numbers of deer and wolves over the entire face of Rowan Mountain. Deer populations were retained in this area even during the die-off of the early 1970s. A wolf den area was located as well as beaver and geese at lower elevations. There is also high marten habitat with large numbers of red squirrels. Sea otters have been seen in Rowan Bay along with river otters.

Potential for forest management is generally limited to the highly productive forest sites on the lower mountainslope because the upper slopes are often too steep and isolated. The proposed units consist mainly of western hemlock forests with some spruce and cedar. This slope is currently not harvested but there are some units behind the Rowan Bay camp that have been sold. All new roads constructed in this operation will be closed following the harvest activities to protect the wildlife populations on this portion of Rowan Mountain.

## Natural Disturbance Patterns

Landslides and windthrow are the two most common causes of natural disturbance on Rowan Mountain. Landslides originate in the very steep upper and mid-slopes and flow downslope forming long narrow features on the landscape. Landslide chutes range from unvegetated areas less than 20 years old, to alder communities, to mature spruce forest about 300 years old.

The other prominent disturbance factor in this area is windthrow. The proposed units on Rowan Mountain are on a south-facing, wind prone slope on the outer coast of Kuiu Island that is subject to frequent catastrophic wind events. Winds often come southeast to southwest up Chatham Strait and hit the face of Rowan Mountain. Wind probability mapping (Kramer, 1997.) indicates moderate to high probability of windthrow. Nearly all forest stands on this mountainslope are in the first three stages of stand development. True old-growth forests only occur on the gently sloping terrace between the bottom of the mountain and saltwater.

**Alternatives 2 and 5:**

With the exception of Units 402-50 and 51 in Alternative 5, which remove 106 and 35 acres using the diameter limit respectively, all units are harvested using the even-aged prescription.

**Alternatives 3:**

The uphill portions of units 402-25 26, 27, 28 and the eastern section of unit 49 harvests 22, 17, 16.4 and 10 acres using an even-aged system. All other portions of these units harvest 0, 8, 0, 3 and 5 acres using the diameter limit, which will maintain between 50 and 60 percent of the existing overstory following harvest.

**Alternative 4:**

Unit 402-25 is not harvested under this alternative. The uphill portion of units 26, 27, 28 and the eastern portion of unit 49 will remove 17, 16, 4 and 10 acres using an even-aged system. All other portions of these units will remove 8, 0, 3, and 5 acres using the two-aged diameter limit system described above. Units 402-30, 31, 32, 50 and 51 are added in this alternative and will be harvested 10, 8, 22, 106 and 35 acres using the two-aged system.

**Crane Creek Units**

The proposed Crane units are located on a southeast-facing slope on the West Side of Port Camden. The hill slope is less than 1,500 feet in elevation. The forested slope is dominantly western hemlock and western hemlock/Alaska yellow cedar forest. Extensive muskegs and mixed conifer forests lie above and below the slope. At the "Stand Level" all are connected to the Small Old Growth Reserve in VCU 399 through the Wild and Scenic River corridor in Kadake Creek, alpine, riparian buffers and the Beach Fringe. At the "Sale Area Level" they connect through the Beach Fringe, Riparian Stream and the Small Old Growth Reserve in VCUs 420 and 421. They connect through these Small Old Growth Reserves to the Medium Old Growth Reserve in VCU 403 and into the Large Old Growth Reserve in the Tebenkof Wilderness Area and thus to the remainder of the island. See the enclosed map for better details and ideas of wildlife movement patterns.

**Table 3-7 Summarized Effects of Crane Creek Units by Alternative**

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Landscape Design	NC	CC=107ac DL=0ac	CC=8ac DL=99ac	CC=8ac CL=99ac	CC=107ac DL=0ac
Within Stand Structure	NC	CC=107ac 10% retained in unit. DL=0ac	CC=8ac 10% retained in unit. DL=99ac 50% retained in unit.	CC=8ac 10% retained in unit. DL=99ac 50% retained in unit.	CC=107ac 10% retained in unit. DL=0ac
Wildlife Corridors	NC	Maintained corridors between beach/alpine habitat.	Maintained corridors between beach/alpine habitat.	Maintained corridors between beach/alpine habitat.	Maintained corridors between beach/alpine habitat.
Road Objectives	NC	2.66 miles of roads closed for wildlife value.	2.66 miles of roads closed for wildlife value.	2.66 miles of roads closed for wildlife value.	2.66 miles of roads closed for wildlife value.

The proposed units are not actually in the Crane Creek watershed, but are beyond the existing harvest units in several small watersheds that flow into Port Camden. The small streams are influenced by easily erodible volcanic bedrock in the area. Prior to the 1970s die-off of the deer population on Kuiu Island, high numbers of deer lived in the Rocky Pass area and Crane Creek area has a similar habitat value. There are relatively low numbers of deer, moose, wolves and bear in the area. There is moderate marten habitat with low numbers of red squirrels. All new roads constructed in this operation will be closed following the harvest activities to protect the wildlife populations.

### Natural Disturbance Patterns

Windthrow is the dominant forest disturbance agent in the vicinity of the Crane units. The area contains stands in the last three stand development stages. Winds often come from the south. Wind probability mapping (Kramer, 1997.) indicates moderate to high probability of windthrow.

#### Alternatives 2 and 5:

Unit's 420- 46, 47 and 48 will harvest 38, 27, and 42 acres using the clear-cut silvicultural method. All clear-cut units will have approximately 10 percent reserve trees remaining after harvest.

#### Alternatives 3:

The northern portion of 420-48 will harvest 8 using an even-aged system, units 46 and 47 will harvest 38 and 27 acres using the two-aged system.

#### Alternatives 4:

The northern portion of 420-48 will harvest 8 using an even-aged system, units 46 and 47 will harvest 38 and 27 acres using the two-aged system.

### West Fork Kadake Units

The proposed West Fork Kadake units are located on a south-facing slope of a 1,500-foot hill in the upper west fork of Kadake Creek. The area generally consists of a long, forested hillslope. There are few muskegs in the area. The bedrock generally weathers to a silty or loamy texture with many sharp, angular rock fragments. At the "Stand Level" all are connected to the Small Old Growth Reserve in VCU 399 through the Wild and Scenic River corridor in Kadake Creek, alpine, riparian buffers and the Beach Fringe. At the "Sale Area Level" they connect through the Beach Fringe, Riparian Stream and the Small Old Growth Reserve in VCUs 420 and 421. They connect through these Small Old Growth Reserves to the Medium Old Growth Reserve in VCU 403 and into the Large Old Growth Reserve in the Tebenkof Wilderness Area and thus to the remainder of the island. See the enclosed map for better details and ideas of wildlife movement patterns.

**Table 3-8** Summarized Effects of West Fork Kadake Units by Alternative

	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Landscape Design	NC	CC=193ac DL=0ac	CC=54ac DL=139ac	CC=54ac DL=139ac	CC=193ac DL=0ac
Within Stand Structure	NC	CC=193ac 10% retained in unit. DL=0ac	CC=54ac 10% retained in unit. DL=139ac 50% retained in unit.	CC=54ac 10% retained in unit. DL=139ac 50% retained in unit.	CC=193ac 10% retained in unit. DL=0ac
Wildlife Corridors	NC	Maintain corridors between alpine and stream habitat.	Maintain corridors between alpine and stream habitat.	Maintain corridors between alpine and stream habitat.	Maintain corridors between alpine and stream habitat.
Road Objectives	NC	2.83 miles of roads closed for wildlife value.	2.83 miles of roads closed for wildlife value.	2.83 miles of roads closed for wildlife value.	2.83 miles of roads closed for wildlife value.

The west fork watershed is approximately 8,980 acres in size and is currently harvested at 17%. The existing units are between 8 and 27 years old. The whole Kadake Creek watershed is approximately 50 square miles in size and is currently harvested at 14 percent. The section of the west fork of Kadake Creek near the units is predominantly well-contained in bedrock. The main portion of Kadake Creek downstream has moderate floodplain development with some bedrock sections. There is moderate habitat for moose, marten and red squirrels. Beaver populations are stable and relatively high. There is high black bear use. Moose populations are on the increase in the Kadake watershed but deer are still very low in numbers. There are large areas of productive western hemlock forests on the slope. All new roads constructed in this operation will be closed following the harvest activities to protect the wildlife populations on this portion of Rowan Mountain.

#### Natural Disturbance Patterns

Windthrow is the dominant forest disturbance agent in the vicinity of the proposed Kadake units. Both wind-generated and old growth stands occur on this slope. These units are in a high to moderate probability area for windthrow (Kramer, 1997). Winds are mostly from the southwest through the Rowan Bay drainage.

#### Alternatives 2 and 5:

Units 421-49 will harvest 97 acres, 50 cuts 39 acres and 51 removes 57 acres using even-aged harvest systems.

#### Alternatives 3 and 4:

The eastern portion of unit 421-49 cuts 29 acres and the northern (uphill) portions of units 50 and 51 cut 12 and 13 acres using the clear-cut prescription (retaining 10 percent Reserve Trees). The remaining portions of these units harvest 68, 27 and 44 acres using the diameter limit (retaining approximately 50 percent of the overstory trees).

## Other Species of Concern

### Alexander Archipelago Wolf

The Alexander Archipelago wolf is a distinct subspecies of gray wolf (Kirchhoff 1991). The subspecies' range includes the islands south of Frederick Sound and the narrow mainland strip west of the Coast Mountains extending from Dixon Entrance northward to Yakutat Bay (Person et al 1996). This range is almost entirely within lands managed by the Tongass National Forest.

Concern expressed about the effects of timber harvest on this far ranging carnivore is National in its scope. Wolves use a wide variety of habitat types. Their presence seems more directly related to the presence of their prey species rather than landform, climate or vegetation.

The estimated total population, found on the Tongass National Forest is about 1200 individuals (Person & Bowyer 1997), distributed among approximately 85 packs (Morgan 1990). The average pack size is 5-6 individuals (Kirchhoff 1994). The primary prey species of wolves in Southeast Alaska is deer (Kirchhoff 1993). In areas where deer are less plentiful, their diet may also include (depending on seasonal availability) beaver, waterfowl and salmon (Kirchhoff 1994). Prey species used by wolves on Kuiu Island are Sitka black-tailed deer, moose, mink, muskrats, marten, salmon, black bears, rodents, beaver, grouse and waterfowl.

The interagency deer model (TLMP 1997 version 7.0.1) indicates sufficient habitat would remain to maintain both hunter and wolf pack use of deer for the foreseeable future in the two Wildlife Analysis Areas (WAAs) that will be impacted by this sale.

In their letter to Beth Pendleton dated September 19, 1997, Person et al, redefined the population needs of deer to maintain both wolf packs and a huntable population in the future. They said: "We recommend a density of 18 deer/mi<sup>2</sup> in the reserves that is capable of producing 30% net recruitment in the absence of predation. This requires a carrying capacity of at least 25-26 deer/mi<sup>2</sup>." Our cumulative effect analysis indicates deer populations will meet these requirements if the Forest Plan were fully implemented to the end of the rotation.

The authors recommend that the deer model outputs be reduced by 20 to 30 percent to better estimate deer populations. We reduced the model outputs on WAAs 5012 and 5013 (see the Subsistence Specialist Report in the Planning Record for the model outputs) and supply exceeds the hunter demand.

Impacts to wolves by roads are an additional concern. People using roads, not the roads themselves, impact wolves. The data on density thresholds developed from studies on Prince of Wales Island (POW) (Person et al 1996, 1997) only addresses concerns for islands with road use and density similar to POW. Unlike POW, the road network on Kuiu Island is not connected to a year-round community or the Alaska State Ferry System. The only way to get vehicles (cars, trucks or ATVs) to the island is by boat or barge, both of which are difficult and costly.

Kuiu Island has been subjected to very little ATV use in the past and we do not expect a significant increase in the future. Road closure procedures cannot exclude all ATV use. The traffic management strategy for roads constructed in this project is not to eliminate all ATV use in the short term, but to discourage it. Over time, vegetative closure, especially natural colonization by alder, will effectively eliminate ATV use. The Road Management Objectives Maintenance Strategy map in Appendix A of this FEIS shows roads that will be put into storage and obliterated. For these reasons, we do not believe that the wolf population on the north end of Kuiu Island is in danger of extirpation.

**Marbled Murrelet**

The marbled murrelet is a robin-sized seabird found throughout the North Pacific. It feeds in near-shore ocean areas, inland saltwater and occasionally on inland freshwater lakes. The bird feeds below the waters' surface on small fish and invertebrates.

The marbled murrelet is a Forest Service Sensitive Species in Alaska. The U. S. Fish and Wildlife Service no longer list category 2 species under the Endangered Species Act. Established marbled murrelet habitat requirements for Southeast Alaska are unknown. There is a need for research on murrelet nesting and foraging habitat requirements, and factors such as oil spills, fishing nets, mortality and predation. State and federal agencies in Alaska are currently gathering the baseline ecological data for this species. Marbled murrelets occur in the waters around the analysis area.

**Goshawk**

The goshawk is a raven sized raptor associated with forests having tall dense canopies. These features allow goshawks to hunt beneath the canopy. Goshawks typically forage over ten thousand acres in Southeast Alaska. Recent information shows the Queen Charlotte Goshawk uses many different landscape features (Iverson, 1996).

The Fish and Wildlife Service considered the goshawk for federal listing as endangered under the Endangered Species Act in 1995 and again in 1997. As yet, the goshawk has not been listed as endangered. The Forest Service, Fish and Wildlife Service and Alaska Department of Fish and Game have signed an agreement to conserve species of concern. These three agencies will work cooperatively in several areas, including joint funding of data collection and genetic studies of the Queen Charlotte Goshawk, Alexander Archipelago Wolf and other important species. There will be an increased involvement of Forest Service, Fish and Wildlife Service and Alaska Department of Fish and Game biologists in the management, planning and implementation process, such as the Tongass Land Management Plan and other timber harvest plans. Design and implementation of agreements would, among other methods, employ an ecosystem approach to conserving the habitat and insure viable populations of the Queen Charlotte Goshawk, Alexander Archipelago Wolf and other important species of concern. The goals of these efforts are several:

- To manage the forest economically and in an environmentally sustainable manner,
- To provide for viable populations of fish and wildlife and
- To act in time to prevent the need to list species as threatened or endangered.

Field surveys were completed on Kuiu Island during the 1993, 1994, 1995, 1996 and 1997 field seasons. A pair was sighted in a previous nesting area on Kuiu but no new nesting activity was reported. Another pair moved from Prince of Wales Island and took up residence in the Security Bay area. The remaining two known pairs are located south of the study area in the Bay of Pillars. No other known pairs occur on Kuiu Island.

Eighty-one percent of the confirmed and probable nest sites in Southeast Alaska are south of Frederick Sound (USDA Forest Service, 1991). The Regional Forester added this species to the Sensitive Species List in 1994.

The Northern Goshawk was also a topic of discussion at the consultation meeting held October 10, 1997 with the interagency implementation team consisting of NMFS, USF&WS, EPA, ADGC, ADEC, and ADF&G (Transition meeting, 1997). No concerns relative to this project regarding the Northern Goshawk were noted.

## Threatened, Endangered or Sensitive Species

Consultation with the U. S. Fish and Wildlife Service, National Marine Fisheries Service and the Alaska Department of Fish and Game (ADF&G) during preparation of this document identified no inventoried resident threatened or endangered species in the project area. The American peregrine falcon (*Falco peregrinus anatum*), which passes through the Forest during spring and fall migration flights; the humpback whale (*Megaptera novaeangliae*), which inhabits nearby waters; and the Snake River sockeye salmon (*Onocorhynchus nerka*), which may occur in the outer waters of the archipelago are all listed as endangered. In addition, the State of Alaska has listed the short-tailed albatross (*Diomedea albatrus*), Eskimo curlew (*Numenius borealis*), blue whale (*Balaenoptera musculus*), right whale (*Eubalaena glacialis*) and humpback whale (*Megaptera novaeangliae*) as endangered. With the exception of the humpback whale, none of these species occur in the area of Kuiu Island.

The Northern (Stellar) sea lion (*Eumetopias jubata*), Snake river spring / summer Chinook salmon (*Onocorhynchus tshawytscha*), and Snake River fall Chinook salmon (*Onocorhynchus tshawytscha*) are all threatened species listed by the National Marine Fisheries Service. There is no important habitat for these species within the area proposed for management activities (See the Biological Assessments and the Biological Opinions in the Planning Record for consultation results).

Goshawk, Marten, Alexander Archipelago Wolf and Other Terrestrial Mammals are important sensitive species on the Tongass National Forest. The Forest Plan covers these species in great detail and those descriptions are incorporated here by reference (See the Biological Evaluation in the Planning Record for more information).

No Federally Listed Threatened or Endangered species will be adversely affected by the proposed actions (see USFWS and NMFS Biological Opinions in the planning record). No Regional Forester's Sensitive species will be adversely affected by the proposed actions (see USFS Biological Evaluation in the planning record).

Both U. S. Fish and Wildlife Service and the National Marine Fisheries were contacted for lists of Threatened or Endangered Species. The only likely land species to occur on Kuiu is the American peregrine falcon and there is no known habitat on the project areas. The marine species that might occur in the waters of and around Kuiu Island are:

1. Stellar sea lion
2. Humpback whale
3. Snake River sockeye salmon
4. Snake River spring/summer Chinook salmon and
5. The fall Snake River Chinook salmon

None of which will to be impacted by these projects (See the Biological Evaluation/Assessments and the Biological Opinions in the planning record). No nesting marbled murrelets have been discovered in the sale area. We have been working on these units for several years now and have not found any evidence of murrelet use. If marbled murrelets are discovered during layout or sale administration, The Forest Plan Standards and Guidelines will be implemented

Figure 3-2.  
Project Area Connectivity  
for Old Growth Habitat  
Strategy

0 13546 27092

Scale is 1 inch = 13546 feet

Custom features added using /gis/projects/crane\_rowan/wildlife/wildbuf.aml  
/gis.projects/crane\_rowan/wildlife/wild\_corr2.map 3/31/98

Environmental Effects - 3 ■29

Existing Managed Stands > 30 Yrs  
Existing/NEPA-Cleared Managed Stands = < 30 Yrs  
Proposed Crane/Rowan Harvest Units  
Lakes and Salt Water  
Productive Old Growth Forest  
Non-National Forest Lands  
Natural Setting TLMP Management Prescriptions  
Beach, Stream, and Estuary Buffers  
Existing or Planned System Roads

Proposed System Roads

Wildlife Travel Corridors





# Watershed Effects

## Definitions

**Anadromous Fish** – Fish which mature and spend much of their adult life in the ocean, returning to inland waters to spawn. Salmon and steelhead are examples.

**High Hazard Soil** – Soil material highly prone to mass wasting. Soil type, bedrock type, and slope angle are factors considered when establishing which sites are high hazard.

**Mass Wasting** – A general term for the dislodgment and down slope transport of soil and rock material by gravity. Mass wasting is often used interchangeably with the term landslide.

**Threshold of Concern** – The point or level of activity beyond which an undesirable environmental response is more likely to occur.

**Watershed** – The area that contributes water to drainage or stream.

**Watershed Analysis** – A systematic procedure for characterizing and evaluating watershed response. Factors likely to influence watershed response are used to indicate anticipated effects. Past, present, and proposed actions are considered.

## Introduction

Precipitation along the southeast Alaska panhandle is heavy. Amounts range from about 60 to over 200 inches per year. Heaviest rainfall occurs in the fall months. The driest months are generally May and June. Even these drier months will often receive greater than 5 inches of rainfall. The abundant precipitation has resulted in a unique lush landscape capable of providing a variety of resources. Important resources directly related to the region's prosperity are timber, anadromous fish (salmon and steelhead), hydroelectric power, and municipal water supplies.

The volume, timing and yield of flow from a watershed are interactions dependent on precipitation, vegetation, soils, topography, and geology. The practice of watershed management focuses on the management of natural resources within a drainage basin to protect, maintain, or improve existing watershed processes.

The Tongass Timber Reform Act (TTRA) directed the Forest to protect fish bearing streams with a minimum of 100 foot no harvest buffers. In addition, the Forest Plan Riparian Standards and Guidelines directs the Forest to provide additional stream protection through the use of riparian management area designation beyond the TTRA buffers. The width of these riparian management areas varies depending upon the channel type. These riparian area Standards and Guidelines illustrated in Appendix B, add protection to non-fishery streams. The Forest Plan also directs the Forest to identify and correct problems found within watersheds.

The Clean Water Act and the National Environmental Policy Act further require that cumulative effects be considered. Cumulative effects are the incremental impacts of individual actions within a watershed when added to other collective past, present, and reasonably foreseeable future actions. Watershed analyses determines the possibility of cumulative effects on important riparian area, aquatic habitat values, geomorphic, hydrologic, and ecosystem processes within a watershed.

### Sediment

Natural resource management can affect sediment production. Roads often contribute sediment to stream (Anderson and Potts, 1987). Good road maintenance minimizes effects from roads as ditches and culverts are kept functional, and problems are fixed as they arise (Burroughs and King, 1989, Bilby, 1985). Closed roads generally contribute less sediment than open roads because they are allowed to grow vegetation and stabilize. Taking out the culverts on closed roads reduces the risk of road wash outs.

Harvest units contribute very little sediment to the streams because forest soils in Southeast Alaska have thick organic surface layers. Following BMPs and Standards and Guidelines that minimize soil disturbance during yarding further reduces the likelihood of erosion. Groundcover that protects the soil and the abundant rainfall promote rapid vegetation regrowth.

Landslides, both natural and management induced, can contribute sediment to stream systems. Researchers have found that timber harvest on landslide prone slopes can increase the frequency of landslides beyond natural levels (Swanston and Marion, 1991). Forest policy is to avoid timber harvest and road construction on landslide prone areas. Landslide prone slopes are mapped and their location placed into the geographic information system (GIS).

Streambed particle size distribution can be measured using a technique developed by (Beverger and King, 1995). This method is one approach for analyzing cumulative watershed effects. The technique allows land managers to compare stream segments over time to determine if management activities have resulted in delivery of fine sediment to streams. The presence of high amounts of fine particles (those 6 mm or smaller) is generally considered detrimental to fish habitat. High percentages of fines have been correlated to reduced salmonid egg and fry survival. Fines reduce the permeability of gravel thereby reducing intergravel dissolved oxygen (Salo and Cundy, 1987).

Beverger and King's studies were conducted in the Rocky Mountain Region of the western U.S. They showed that where areas are disturbed by wildfire or improperly conducted land management activities the percentage of fines found in channel streambeds increased. These disturbed sites generally contained more than 20 percent fines while undisturbed reference streams were below 10 percent total fines.

Sufficient data have not been collected in southeast Alaska to determine with any certainty the applicability of these studies. One study conducted within the planning area found that 7.67 percent of streambed materials in Saginaw Creek were smaller than 0.83mm (Sheridan, et al 1984).

Four streams were measured within the planning area. Sampling was done on October 6, 1997. Data collected in May of 1996 from Alex Creek, an unlogged watershed located on Kuiu Island south of the planning area, was used as a control. Table 3-9 gives the percent of fine particles less than 6 mm measured in each stream. All streams are below 20 percent, which can be used as a threshold of concern (Reiser and Bjornn, 1979). Direct comparison between the particle size distribution listed below is not appropriate because of differences in channel type and watershed size.

**Table 3-9** Percent of Fine Particles

Stream	% < 2mm	% 2mm to 6mm	Total % <6mm
East Fork Security	6	2	8
West Fork Security	4	10	14
Saginaw	10	6	16
Kadake	6	2	8
Alecks (unlogged control)	5	1	6

## Streamflow

The effects on stream flow are likely related to the amount of clear-cutting and total acreage of roads in a watershed. One study on Prince of Wales Island found that low flow increased slightly following extensive clearcut harvest. No other changes in watershed response were found (Bartos, 1989). Another study conducted in British Columbia indicated that when 30 percent of a forested watershed was clearcut harvested that there is a significant effect on water yield. This research from 1971 to 1983 showed a 21 percent increase in total water yield and increased peak flows (Cheng, 1990). Increased peak flows can cause channel adjustment during moderate flood events. Since severe storms in southeast Alaska are generally of long duration and since soils are likely to be saturated regardless of the age of forest cover, significant increases in flow from large magnitude storm events are unlikely.

## Watershed Analysis

Appendix J in the Forest Plan states that watershed analysis must be completed for any project that proposes to deviate from Riparian Standards and Guidelines as presented in the Forest Plan. No alternative proposes to deviate from these Standards and Guidelines.

In addition, the presence of the following may also trigger watershed analysis:

- high value fisheries,
- high sediment yield risk,
- presence of threatened, endangered or sensitive aquatic species,
- a high density of roads or stream crossings, or
- More than 20 percent of the watershed acres have second growth stands younger than 30 years.

The level and intensity of analysis conducted should be proportional to the specific questions being addressed (USDA Forest Service, 1997a).

## Affected Watersheds

Timber harvest is being considered in five watersheds larger than one square mile. All five provide habitat for anadromous fish. Table 3-10 displays their sizes and the miles of stream by class.

**Figure 3-3 Affected Watersheds**



**Table 3-10** Affected Watershed Acres and Stream Miles

Watershed	ADF&G Number	Watershed Size (acres)	Miles of Stream		
			Class I	Class II	Class III
West Fork Kadake	109-42-10300B	8,908	17.0	4.7	31.6
Total Kadake	109-42-10300	31,438	73.6	15.8	81.0
Security	109-45-10100	5,954	11.5	3.0	13.2
Dean	109-50-10070	4,725	10.8	3.1	10.3
Unnamed North	109-52-10020	1,718	0.7	2.8	7.0
Unnamed South	109-52-10010	875	0.6	3.0	3.6

### West Fork Kadake Creek

Kadake Creek is the largest producer of salmon on Kuiu Island. The Alaska Department of Fish and Game has identified it as one of 19 "High Quality Watersheds" in Southeast Alaska. Kadake Creek is a popular destination for sport anglers pursuing steelhead and it has been receiving more interest from the outfitter/guide industry. The west fork of Kadake Creek contains 17 miles of anadromous stream. It produces cutthroat trout, steelhead, Dolly Varden char, and pink, chum, and coho salmon. Pink and chum salmon spawning habitat is limited to the lower portion of the watershed where lower gradient, floodplain channel is present. Coho salmon are present throughout the anadromous waters.

Most of the previous harvest in this sub-watershed occurred between 1975 and 1989. Even though this was prior to TTRA, most of the Class I streams received buffers that exceeded the 100' TTRA minimum. According to the GIS database, only 5 acres of riparian area (based on soils inventoried as riparian soils) have been harvested.

An intensive watershed analysis of Kadake Creek was completed in 1995 (USDA Forest Service, 1995a). A watershed restoration project to revegetate all identified sediment sources and correct all road drainage problems is planned for 1998.

### Security Creek Units

The Security Creek watershed, approximately 6,000 acres in size, contains 27 miles of inventoried stream. Security Creek contains nearly 10 miles of anadromous stream that produces pink, chum and coho salmon, Dolly Varden char, and cutthroat and steelhead trout. The east fork of Security Creek contains several small bedrock falls, which are not barriers to coho but may limit pink and chum salmon. Nearly all the anadromous waters on the south fork are available to pink, chum, and coho salmon. Since 1975, pink salmon peak escapement has ranged from several thousand fish to nearly 50,000. The two highest escapements recorded since 1975 were 1986 (47,000 pinks) and 1996 (46,000 pinks). In early October of 1997, over one hundred coho were observed in the area where the 6402 bridge crosses the east fork.

Only one serious impact associated with roads was identified within the watershed. Fill from a road washed out when a 48-inch culvert was plugged with organic debris or when runoff was too great for the culvert to handle. About 1000 cubic yards of coarse textured road fill entered the stream at this site. The date of the failure is unknown, however, it likely occurred during the large storm on December 1, 1988 that resulted in extensive landslides and road

drainage failures on north Kuiu Island. Field surveys found few areas of accelerated erosion within the watershed that was associated with timber harvest.

### Crane Units

The three units in the Crane area are not in the Crane Creek watershed. They are in two small watersheds that drain directly into Port Camden. These watersheds do not have anadromous fish present though resident trout are present in the lower reaches.

### Cool Lake Units (Dean Creek)

The two units in the Cool Lake area occur in two different watersheds. Unit 399-13 is in a small, non-anadromous watershed draining directly into Saginaw Bay. Unit 400-18 is partially in the Dean Creek watershed.

The Dean Creek watershed contains 4721 acres. A fishpass was constructed approximately 0.5 miles upstream from the mouth on Dean Creek in 1984 for coho enhancement. The fish ladder made available 9.0 miles of upstream habitat. Although pink and chum habitat may be limited to the first mile above the ladder, coho habitat has been expanded throughout the Class I stream.

### Rowan Mountain Units

The units in the Rowan Mountain area are in three small watersheds draining into Chatham strait. Two of these streams are recognized as anadromous fish streams.

Approximately one mile of coho habitat is present in Unnamed Creek #1 (ADF&G #109-52-10020). Small numbers of pink and chum salmon may use the lower reaches but several partial barriers are present upstream. Both Dolly Varden char and cutthroat trout have been identified in Class II waters in this stream.

Unnamed Creek #2 (ADF&G #109-52-10010), originates from a lake about two miles upstream. The gradient of this stream rises quickly and coho habitat is limited to the first 0.5 mile. Due to the higher gradient, pink and chum habitat is limited to a few hundred feet upstream of the mouth. Resident Dolly Varden char and cutthroat trout are present upstream.

## Effects of Alternatives

Most units included in the Crane and Rowan Mountain Timber Sale proposal were analyzed in the north and east Kuiu EIS. Watershed sensitivity analysis (McCorison et. al, 1989) conducted during the North and East Kuiu NEPA process suggested that no watersheds had exceeded their thresholds of concern (N&E Kuiu FEIS, 1993). This analysis was used as a starting point in developing alternatives for this EIS.

The potential for impacts to watershed resources were analyzed for each affected watershed greater than one square mile in size. Impacts associated with timber harvest vary depending on road location and design, and the type of harvest prescription. Roads on steep terrain or poorly maintained roads will have much greater effects than well-maintained roads on gentle terrain. In this analysis, miles of new road construction and the acres of harvest are used as indicators of the potential risk of adverse impacts. Likewise, total road density in a watershed and the amount of second growth stands less than 30 years old are used as indicators of the potential for cumulative impacts.

The Forest Plan riparian standards and guidelines will be fully applied to all alternatives. Established best management practices (BMP's) will be applied equally to all alternatives (FS Soil and Water Conservation Handbook R10 Amend. No. 2509.22-96-1). Each alternative is expected to meet State of Alaska water quality standards.

### Roads

Table 3-11 shows the number of miles of new road proposed for each alternative. Higher miles of road construction indicates a higher potential for road related sedimentation.

**Table 3-11** Proposed Roads by Alternative (Miles)

Watershed	Alt. 1		Alt. 2		Alt 3		Alt4		Alt. 5	
	Syst	Temp	Syst	Temp	Syst	Temp	Syst	Temp	Syst	Temp
West Fork Kadake	0	0	0	2.8	0	2.8	0	2.8	0	2.8
Total Kadake	0	0	0	2.8	0	2.8	0	2.8	0	2.8
Security	0	0	0	1.0	0	1.0	0	0	0	0
Dean	0	0	0	0	0	0	0	0	0	0
Unnamed North	0	0	0	0.1	0	0.1	0	0.1	0	0.1
Unnamed South	0	0	0	1.6	0	1.6	0	1.5	0	1.6

To reduce the likelihood of roads causing unwanted impacts to the stream systems, all proposed roads will be closed following harvest activities. Bridges will be removed and culverts will be removed or replaced with water bars.

#### **Cumulative Roads**

Table 3-12 lists the miles existing and proposed roads and the cumulative road densities (miles of road per square mile of watershed) for the six affected watersheds within the study by alternative. Road condition, whether stable or in need of repair, has more influence sedimentation than does the actual length of road. A short length of eroding roadbed may yield far more sediment than many miles of stable road. Therefore, areas with higher road densities indicate higher potential risk, but not necessarily greater actual effects. Table 3-12 shows existing road miles and total road densities for each watershed.

**Table 3-12 Road Miles and Densities by Alternative (System and Temporary)**

Watershed	Alt.1		Alt. 2		Alt. 3		Alt. 4		Alt. 5	
	S <sup>1</sup>	All <sup>2</sup>	S	All	S	All	S	All	S	All
West Fork Kadake										
Miles	11.4	21.8	11.4	24.7	11.4	24.7	11.4	24.7	11.4	24.7
Density	0.82	1.6	0.82	1.8	0.82	1.8	0.82	1.8	0.82	1.8
Total Kadake										
Miles	43.6	81.6	43.9	84.5	43.9	84.5	43.9	84.5	43.9	84.5
Density	0.89	1.66	0.89	1.72	0.89	1.72	0.89	1.72	0.89	1.72
Security										
Miles	9.1	16.3	9.1	17.3	9.1	17.3	9.1	16.3	9.1	16.3
Density	0.98	1.8	0.98	1.86	0.98	1.86	0.98	1.8	0.98	1.8
Dean										
Miles	6.7	15.3	6.7	15.3	6.7	15.3	6.7	15.3	6.7	15.3
Density	0.91	2.06	0.91	2.06	0.91	2.06	0.91	2.06	0.91	2.06
Unnamed North										
Miles	0	0	0	0.1	0	0.1	0	0.1	0	0.1
Density	N/A	N/A	N/A	0.04	N/A	0.04	N/A	0.04	N/A	0.04
Unnamed South										
Miles	0	0	0	1.7	0	1.7	0	0	0	1.7
Density	N/A	N/A	N/A	1.21	N/A	1.21	N/A	N/A	N/A	1.21

<sup>1</sup>S = System roads – open roads only

<sup>2</sup>All = Open and closed roads

Generally lower road densities are considered to have less risk of adversely effecting watershed function.

Most of the closed temporary roads are in stable condition. On the ground inspections indicate that road density and condition are acceptable assuming needed restoration work is completed as anticipated.

## Harvest

The four action alternatives present different mixes of diameter limit harvest and clear-cutting. Much of this harvest will be conducted using helicopters to yard logs. It is anticipated that the diameter limit harvest prescription would mimic the general appearance of windthrow generated stands. It is unknown if this prescription will induce further blowdown beyond what might have occurred naturally. Monitoring the results of this harvest prescription will allow further modification of the practice. Where clear-cuts are prescribed, approximately 10% of the canopy will be retained within the units. The effects and risks

associated with clearcut harvest is better understood than other types of harvest as this has been the dominant harvest prescription in Southeast Alaska. However, retention of approximately 10 percent of the canopy should make these units more natural in appearance and function. Windthrow may serve an important role in rejuvenating site productivity through uprooting and soil churning (Bormann, 1995).

The number of acres harvested is an indication of the degree of risk of altering watershed response. These data are presented in Table 3-13 below for each of the affected watersheds.

**Table 3-13 Proposed Harvest by Alternative (Acres)**

Watershed	Alt. 1	Alt. 2		Alt. 3		Alt. 4		Alt. 5	
		Clearcut	Diameter Limit	Clearcut	Diameter Limit	Clearcut	Diameter Limit	Clearcut	Diameter Limit
West Fork Kadake	0	193	0	54	139	54	139	193	0
Total Kadake	0	0	0	54	139	54	139	193	0
Security	0	167	0	0	167	0	352	0	0
Dean	0	47	0	0	47	0	47	47	0
Unnamed North	0	59	0	6	53	6	53	50	12
Unnamed South	0	64	0	56	4	34	4	64	0

## Percent Second Growth

The percentage of second growth stands less than 30 years old plus the proposed clearcut harvest by alternative is shown in table 3-14 below. The calculations were based on the thirty year period beginning in 1969, 1999 being the earliest possible harvest date anticipated as a result of this planning effort. Since the proposed diameter limit harvest will maintain about 50% of the existing canopy of old trees it is not included in Table 3-14. No future timber management within the watersheds analyzed is planned within the next 10 years (USDA Forest Service, 1997h).

**Table 3-14 Percent of Second Growth less than 30 Years Old (1969-1999)**

Watershed	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
West Fork Kadake	17.6	19.7	18.2	18.2	19.7
Total Kadake	16.2	16.8	16.4	16.4	16.8
Security	23.0	25.8	23.0	23.0	23.0
Dean	31.2	32.2	31.2	31.2	32.2
Unnamed North	0	3.4	0.3	0.3	2.9
Unnamed South	0	7.3	6.4	3.9	7.3

Since both Security and Dean Creek watersheds have greater than 20 percent second growth stands younger than 30 years, a detailed watershed analysis was completed. (USDA Forest Service, 1997f).

## Summary of Watershed Analyses for Security and Dean Creeks

Field reconnaissance showed that most roads near Class I and II streams are on gentle slopes where there is little danger of adversely affecting water quality. Roads near Class III streams are on steeper slopes and present relatively greater risks to water quality. Road restoration work needed within Security and Dean Creek Watersheds were identified. The needed restoration work can be accomplished easily with ongoing forest watershed restoration and road management programs. All alternatives avoid high hazard soils with both roads and harvest units. Most past timber harvest was conducted more than 20 years ago and these units are now fully stocked with second growth trees.

In **Alternative 1**, no further harvest or road construction is proposed within the planning area.

**Alternative 2** proposes the most clearcut harvest of all action alternatives. An additional 167 acres would be clearcut in Security Creek Watershed and 47 acres would be clearcut in Dean Creek Watershed. Following implementation, 26 percent of Security Creek and 32 percent of Dean Creek would be in second growth forest.

An additional one-mile of road will be constructed in Security Creek Watershed. No new roads will be built in Dean Creek Watershed.

A mix of clearcut and diameter limit harvest is proposed for **Alternative 3**. However, no additional clearcut harvest is proposed in Security or Dean Creek Watersheds. Diameter limit harvest of 167 acres in Security Creek Watershed and 47 acres in Dean Creek Watershed is proposed.

No additional roads will be built in Dean Creek Watershed. . An additional 1-mile of road will be constructed in Security Creek Watershed.

A mix of clearcut and diameter limit harvest is proposed for **Alternative 4**. However, no additional clearcut harvest is proposed in Security or Dean Creek Watersheds. Diameter limit harvest of 352 acres in Security Creek Watershed and 47 acres in Dean Creek Watershed is proposed.

No additional roads will be built in Dean or Security Creek Watersheds.

**Alternative 5** proposes no harvest or road construction within the Security Creek watershed. The Dean Creek watershed will have one 47-acre clearcut with no additional roads.

# Timber Economics

## Definitions

**Mid-Market** – Timber markets have historically been subject to both high and low cycles and will probably do so in the future. In order to incorporate these variations a “normal” or mid-market which represents average long term conditions is developed.

**Pond Log Value** – The difference between the end product selling value and manufacturing costs; the value of logs as they are delivered at the mill.

**Logging Costs** – All costs associated with delivering logs to a milling facility.

**MBF** – Thousand board feet of timber.

**MMBF** – Million board feet of timber.

**Specified Road** – Roads that have a long term management objective

**Temporary Road** – Roads that are needed only for the current timber sale management activities

**Other Temporary Developments** – Includes costs of camp development, mobilization, etc.

## Introduction

The Forest Service Timber Sale Preparation Handbook requires an economic efficiency analysis to compare benefits and costs of a project. The Handbook direction seeks to ensure that projects have at least a 60 percent of normal profit margin during a normal (mid-market) condition. This economic efficiency analysis compare expected gross revenues at the mid-market to estimated costs so net revenues could be determined.

## Mid-Market Analysis

Mid-market values and stump to truck logging costs vary by volume strata. The variations are the result of stand characteristics that vary by volume strata (e.g. number of logs/mbf, defect, grade, and species mix). Pond log value is the value of the logs as they arrive at the mill; the end product selling value minus the manufacturing costs.

All costs required to deliver logs from the stump to the mill have to be considered when determining timber sale economics. These costs include activities associated with stump to truck logging, specified road construction and reconstruction, temporary road construction, camp development, camp mobilization, and log transportation from the landing to the manufacturing sites (truck hauling, barging, and water tow).

The estimated net timber value is determined by subtracting logging costs from the mid-market pond log values of the timber in harvest units of each alternative. Individual units may not be economical to harvest alone, but they are economic when included with other units in the alternative. The result is less productive sites or stands can be managed as productive forestland.

Table-3-15 summarizes timber values and costs to a timber operator of average efficiency, and net stumpage to the government, at the mid-market level for each alternative considered. Before timber is sold, a timber cruise and appraisal will be completed.

**Table 3-15 Timber Cost and Value Summary**

	Alt 2	Alt3	Alt4	Alt5
<b>Volume(mmbf)</b>	23.0	17.8	24.0	21.0
<b>Selling Value (\$/mbf)</b>	\$374.56	\$381.20	\$382.38	\$374.52
<b>Costs (\$/mbf)</b>				
Stump to Truck	\$157.48	\$161.44	\$196.75	\$159.59
Transportation	\$50.57	\$78.16	\$52.23	\$59.33
Temporary Roads	\$7.92	\$10.56	\$4.54	\$5.49
Temporary Road Miles	2.42	2.24	1.40	1.49
Other Temp Develop	\$5.04	\$6.72	\$5.00	\$5.68
Specified Roads	\$44.21	\$58.92	\$43.83	\$49.78
Specified Road Miles	6.59	6.59	6.59	6.59
<b>Profit and Risk</b>	\$59.18	\$59.72	\$59.18	\$59.42
<b>Net Stumpage Value</b>	\$48.88	\$5.72	\$19.52	\$34.45
Indicated Advertised Rates	\$93.09	\$64.64	\$63.35	\$84.23

USDA Forest Service, 1997g

Alternative 2 and 5 provides the best return. Alternative 3 and 4 provides the least return.

## Current Vs Middle Market

Current timber sale economics are somewhat better than the mid-market scenario used to compare alternatives here. Several factors have combined to produce a market that is higher than what has been experienced on the average:

- Markets up and down the West Coast have been influenced by the Presidents Forest Plan for the Pacific Northwest to address the Spotted Owl issue. Because of scarcity of wood timber sales have been selling for more than advertised rates
- Here in Southeast Alaska, appraised rates have not yet incorporated the effect of the pulpmill closures and probably do not accurately reflect the current demand as evidenced by the recent higher than advertised bids received for timber sales.

## Effect of Diameter Limit on Selling Value

To test the effect of the 2-aged silvicultural prescription (diameter limit) on selling values, existing timber sale cruise information for timber stands within the Crane and Rowan Mountain Project Area was analyzed.

Application of the diameter limit to the combined Saginaw and Rowan Settlement cruise statistics suggests selling values would increase approximately \$10.00/MBF over an even aged clear-cut harvest example. This is because the utility volume and poorer grades of lumber are more heavily represented in the trees being left to provide wildlife legacies and maintain natural disturbance patterns. This is reflected in the above Table 3-15.



# Scenery

## Definitions

**Adopted Visual Quality Objectives** – These are VQO's that are incorporated into the Forest Plan. They consider other land management decisions such as intensive timber production.

**Distance Zones**– distance at which the landscape is visible, as viewed from Visual Priority Travel Routes and Use Areas. Used as a frame of reference for discussions of landscape characteristics and effects of management activities.

Foreground – 0 to ¼-1/2 mile

Middleground – ¼-1/2 mile to 3-5 miles

Background – greater than 3-5 miles

**Visual Priority Travel Route or Use Area** – viewing locations from which scenic impacts are assessed, typically defining where the greatest concern for scenic quality exists.

**Visual Quality Objectives** – Visual Quality Objectives (VQO's) are established by combining different characteristics of scenery such as how varied the landscape looks, whether or not it is seen from well used viewpoints, and how far away it is. Visual Quality Objectives provide measurable standards for management based on the landscapes' scenic characteristics and public viewing concern. The objectives describe both visual resource goals and levels of variation from the characteristic landscape.

**Viewshed** – A viewshed is defined as a geographically distinct landscape that people can view or perceive as a single unit.

## Introduction

Scenery is everything that people see in the landscape. The visual compositions that we see are interpreted in part by each person's past experiences and expectations. Scenery may evoke feelings of emotion, inspiration, and well being. For that reason, government laws, policies, and directives require National Forests to consider scenic values. Within this context, scenery is regarded as a primary resource "to receive equal consideration with other resources", and, that scenery conservation principles are "to be applied not only in especially sensitive areas or unusual circumstances, but routinely in all activities" (FSM 2380.3).

Southeast Alaska scenery generally includes mountains, glaciers, water, sky, weather, trees, animals, boats, people, and development. While there are an infinite number of personal interpretations of scenery, general preferences are predictable based upon cultural norms and the predominant values of society. Some people using major travel routes and use areas expect the forest to look natural while others don't mind seeing evidence of development.

North Kuiu Island is distinguished in landscape character by rolling terrain of between 300-1,500 feet separated by an intricate network of waterways. Scattered block-like mountains, having rounded hummocky summits 2,000 to 3,500 feet in elevation rise above the general level of the lowlands. Numerous small rocky islands, shorelines and rock reefs are evident in the waterways. Generally other rock forms are isolated and visually insignificant. There are outstanding limestone cliff formations located in the Saginaw Bay area. Outer coasts exposed

to the open ocean exhibit a variety of geological-erosion forms such as occasional small gravel beaches, indistinct cliff formations and rocky promontories. Spruce and hemlock forest is predominant. There are also significant areas of muskeg.

Primary access for recreational use on Kuiu Island depends to a large extent on saltwater access. Developed facilities are limited to a few canoe/kayak portage trails that provide access across narrow isthmuses to create loop opportunities, avoid exposed bodies of water, and eliminate traveling long distances, two Forest Service recreation cabins along the island's eastern shore and a new three sided log shelter in the Bay of Pillars. Waterfowl hunting is sporadic and usually confined to estuaries. Black bear are prevalent and hunted throughout the area. Fishing for salmon, steelhead, and other trout species occurs in many of the island's streams. Other activities include harvesting edible shellfish, crab, and shrimp. Simply searching for solitude and testing one's self-reliance skills as well as viewing scenery and wildlife are other activities. Although recreational opportunities abound, numbers of users are low. This is no doubt due to the remoteness of the area. Outfitting and guide use is increasing in and around Kuiu Island. Small groups are typical for hunting and fishing related activities, but larger groups are known to participate in educational and scenic touring in activities such as kayaking.

There are no regularly scheduled means of public transportation to Kuiu Island, although air taxi service is available on a charter basis. Roads, accessing the interior of the project area are not linked to any inter-island transportation network. The closest Alaska Marine Highway ferry terminal is located in the community of Kake where many canoe and kayaking trips begin.

Logging associated with roading began on north Kuiu Island in the early 1960's at Saginaw Bay. In 1972, Kuiu Island became the contingency area for the APC Long-Term timber sale contract, until rescinded in 1995. The visual condition and appearance reflect the past demands for timber production in the area. South and southeast Kuiu Island exists in a relatively pristine condition with only a minor amount of older harvest still visible. East Kuiu Island, particularly in the Three-Mile Arm area has some visible evidence of recent timber harvest.

## Desired Future Visual Condition

The desired future visual condition of North Kuiu Island is guided by management prescriptions in the Forest Plan. All units proposed for harvest in the Crane/Rowan Mountain EIS is located within the Timber Production land use designation. This management prescription provides for suitable timberlands to be managed for the production of wood on a sustained yield basis. Road systems are developed in conjunction with timber management to be compatible with recreational uses, hunting and fishing, and other public uses. Timber harvest will generally appear highly evident and a visually dominant characteristic in most seen areas within the Timber Production LUD. A more detailed discussion of the Timber Production management prescription can be found in the Forest Plan (TLMP, 1997).

## Adopted Visual Quality Objectives

The adopted Visual Quality Objectives for the Timber Production management prescription are Modification in the foreground and Maximum Modification in all other viewing locations within this LUD. These may be further refined to meet the desired future condition described for specific management prescriptions. Non-development land use designations also exist and are interspersed across North Kuiu Island. The following visual quality objectives apply to the project area:

**Retention:** Changes in the landscape must not be visually evident to the casual forest observer. Modifications must repeat form, line, color, and texture found in the surrounding natural landscape.

**Partial Retention:** Changes in the landscape may be visually evident, but must be integrated into and visually subordinate to the surrounding landscape. Activities may introduce form, line, color, and texture not common in the surrounding landscape, but they should not attract attention.

**Modification:** Changes in the landscape may visually dominate the surrounding natural landscape, however they must repeat the naturally established elements of form, line, color, and texture to appear compatible with the surrounding natural landscape.

**Maximum Modification:** Management activities may visually dominate the characteristic or surrounding natural landscape, yet when viewed in the background activities appear as natural occurrences within the landscape.

Table 3-16 shows the area and percent of each VCU for each adopted visual quality objective in the Forest Plan.

**Table 3-16** Adopted Visual Quality Objectives

VCU	Retention		Partial Retention		Modification		Maximum Modification	
	<i>Acres</i>	%	<i>Acres</i>	%	<i>Acres</i>	%	<i>Acres</i>	%
399 – Saginaw Bay	2511	10%	0	0%	3,530	14%	19,252	76%
400 – Security Bay	1085	4%	11,341	41%	1,216	4%	14,226	51%
402 – Rowan Bay	3674	12%	52	0%	921	3%	27,120	69%
420 – Port Camden	96	2%	358	6%	1,149	18%	4,688	74%
421 – Kadake Creek	1211	4%	4615	13%	869	3%	27,348	80%

Source: Stikine Area GIS

## Visual Priority Travel Routes and Use Areas

Visual Priority Travel Routes and Use Areas identify viewing locations from which scenic impacts are assessed. These areas typically define where the greatest concern for scenic quality exists. The expression used to indicate visibility of proposed activities from Visual Priority Travel Routes and Use Areas is that it is “seen”. “Seldom-seen” landscapes indicate that they are not viewed from priority travel routes and use areas.

Visual Priority Travel Routes and Use Areas associated with North Kuiu Island include Rowan, Security, Saginaw, Kadake Bays, Port Camden, Keku Strait, and Chatham Strait and Frederick Sound. All these destinations receive seasonal, intermittent to moderate use over the course of the year. Recreation use in the area is increasing. It is typically marine related recreation during the summer months. Cruise ships and sightseeing excursions travel along Chatham Strait on the West Side of Kuiu Island, and are reported in Tebenkof Bay and Security Bay. The Alaska Marine Highway is located to the north of Kuiu Island in Frederick Sound. Scenic guidelines for the management of scenery visible from these locations are outlined in the Forest Plan.

Kadake and Fall Dog Creeks have been recommended in the Forest Plan for further consideration for Wild and Scenic River designation. The river corridors are recognized as Use Areas for dispersed recreation on the Petersburg Ranger District Visual Priority Travel Routes and Use Areas listing. No proposed units would be visible from Fall Dog Creek or Kadake Creek as topography or vegetation would screen harvest from view. Areas adjacent to these river corridors are in the Timber Production Land Use Designation. The Adopted Visual Quality Objectives for this management prescription would be applied.

## Alternatives and Effects

For the purposes of this analysis, Value Comparison Units (VCUs) are being used as a basic unit of land to assess visual conditions. A viewshed is defined as a geographically distinct landscape that people can view or perceive as a single unit. Viewsheds may overlap, depending on the viewing distance and position of the viewer. From changing positions such as travel routes, viewsheds constantly shift and overlap.

The Forest Plan provides measures for retaining pristine to natural appearing landscapes for areas allocated other than Timber Production. These areas represent to a great extent most locations of high scenic concern. In those areas allocated for intensive timber management, a moderate degree of emphasis is provided in retaining scenic quality. The greatest visual effects occur immediately following timber harvest. Impacts associated with timber harvest may vary, and the degree of impact depends upon the intensity of harvest (size and shape), design (silvicultural treatment and location), ground conditions (soil characteristics and slope), and orientation to viewer. Impacts are typically most evident in the near to mid distances (foreground and middleground).

### Cool Lake Units

The Cool Lake units are visible from Saginaw Bay, which is used for various types of recreation. Much of the bay's eastern shoreline provides opportunities for rock hounding, fossil collecting, and the study of Native culture. Of special interest is Halleck Harbor. A gentle sloping sand beach and protected anchorage attract numerous boaters. A log transfer site on the south side of the bay provides access to the road system on Kuiu Island. Waterfowl hunting occurs at the head of the bay, and fishing in Saginaw Creek. Outfitters

and guides utilize Saginaw Bay for their operations and there is a Special Use Permit for a residence near the head of the bay.

The limestone bedrock adjacent to Saginaw and the Keku Islets has been identified as having a high potential for cave formation similar to those found on Prince of Wales Island. Opportunities exist for future trail development to Cool and Ledge lakes, allowing easier access for stream and lake fishing.

#### Alternatives 2 and 5:

Activities proposed in these alternatives are identical and have similar visual consequences. Two units (399-13 and 400-18) would be visible to varying degrees from Saginaw Bay, and designed for clear-cut harvest. While not located in VCU 399, Unit 400-18 is visible to the greatest degree from Saginaw Bay. Both units would meet the Modification VQO as seen from Saginaw Bay and Frederick Sound.

#### Alternatives 3 and 4:

Proposed harvest design in these alternatives would have slightly less visual effect by achieving a Partial Retention VQO in Unit 400-18. Silvicultural treatment and visual effect would remain the same for Unit 399-13 as in Alternatives 2 and 5.

#### Cumulative Effects:

Past, present and future logging activities would result in a landscape dominated by openings of various ages, design characteristics and sizes. The Saginaw Bay area has been extensively logged over the years and its appearance reflects the intensity of these activities.

## Security Units

Fishermen, hunters, and recreationists' view the landforms on either side of this bay, and a private residence located on the eastern shoreline. Secure anchorages exist at numerous points along the bay's shoreline. Excellent waterfowl and black bear hunting occur at the head of the bay. The State of Alaska has designated some of the large islands, and parts of the eastern shoreline in the northeast corner of the bay, as a State Marine Park. No facilities currently exist in the Marine Park.

Well-defined slopes rise along the shoreline in the inner bay. The landscapes associated with these areas consist of rolling terrain with topographic relief varying from 1,000 to 3,000 feet. The area is largely covered with hemlock/spruce forests, with interspersed mountains and summits serving as focal points. Five units are within the Security Bay viewshed and located several miles south from the head of the bay. Portions and varying combinations of these units are visible in the middleground and/or background from this body of water in the proposed alternatives.

#### Alternative 2:

Alternative 2 would have the greatest visual impact in proposing Units 400-8, 9, 11, and 12 for clear-cut harvest. Unit 400-12 would not be visible from inside Security Bay and the remaining 3 units would achieve the Modification VQO.

#### Alternatives 3 and 4:

Activities proposed in these alternatives are similar in visual effect. Alternative 3 proposes partial harvest treatment for Units 400-9, 11, 12, and clear-cut harvest for Unit 400-8 which is partially screened from view. Alternative 4 proposes partial harvest treatment for in 400-9, 11, 12, and 13. The Partial Retention VQO is achieved in both these alternatives.

#### Alternative 5:

No timber harvest is being proposed and development is deferred. The characteristic landscape will be maintained in its current condition.

### Rowan Mountain Units

#### Cumulative Effects:

The East Side of Security Bay exists in a highly modified condition, and would continue to appear so into the year 2011. In the reasonably foreseeable future, views from the marine park of the West Side of the bay would be maintained in a pristine, natural condition. The salt chuck to the south would continue to provide a primitive setting.

A variety of activities occur within Rowan Bay. As the site of a past sortyard, logging camp and log transfer facility, the associated development remains evident. Commercial fishing and crabbing vessels also use this area. Access is possible to the interior road system by use of the existing log transfer facility at nearby Rowan Bay. Hunting and sport fishing occur in the estuary of Rowan Bay also. Boaters frequently anchor in a small cove on the south shoreline near the bay's mouth.

The north side of Rowan Bay is visually dominated by Rowan Peak, which reaches an elevation of 3210 feet. Alpine slopes are scattered with isolated stands of timber, and provide a distinctive landscape setting as seen from the bay or Chatham Strait. Outside the bay and to the north, avalanche chutes are evident with exposed white rock on the upper reaches capturing the viewer's attention. This landform is complex in its steep, incised notches and valleys facing onto saltwater. This area exists in a natural appearing condition.

Several logging units and associated roads are apparent along the south side of Rowan Bay. These units dominate views from the camp, dock, and Rowan Bay in general. Past timber harvest at the head of the bay are also evident, but do not tend to dominate the view due to a greater viewing distance and the age of the regenerating stands.

Eleven units are proposed in varying combinations and silvicultural treatments on the lower slopes north of Rowan Bay. They face the entrance to the bay and are visible in the middleground distance from Rowan Bay and background distance from Chatham Strait.

#### Alternatives 2 and 5:

Alternatives 2 and 5 have similar effects and the greatest potential visual impact. Units 402-25, 26, 27, 28, 29, 30, and 31 would be visible in Alternative 2 from the entrance to Rowan Bay which is the location for optimal viewing. A Modification VQO would be achieved. Alternative 5 is nearly identical to Alternative 2 in visual effects with the exception of treating Unit 29 and adding Units 50 and 51 as partial harvest. An overall Modification VQO would also be achieved. Harvest activities proposed in this VCU have been designed to work with naturally occurring features found in the landscape. Avalanche chutes and vertically oriented openings are visible from Rowan Bay when looking north. Units have been designed to minimize their dominance on the landscape and work with these features as well and existing harvest units located to the west.

#### Alternatives 3 and 4:

Activities proposed in these alternatives are similar in effects and would have significantly less visual impact than those proposed in Alternatives 2 and 5. Design for partial harvest treatment in the majority of units would achieve an overall Partial Retention VQO as seen from the entrance to Rowan Bay, and to an even lesser degree from Chatham Strait.

#### Cumulative Effects:

Entering Rowan Bay, the viewer currently encounters a landscape altered by timber harvest activities. Patterns established through clear-cutting dominate the seen area, and would continue to do so through 2011. Management activities located on the north side of Rowan Bay would not appear as evident as other locations within the bay.

**Crane Creek Units**

These units overlook Port Camden where recreation activities commonly occur. The configuration of the bay and the estuarine areas attract recreation use. The island complex on the east shoreline provides a good anchorage for boaters. Known shoreline occurrences of petrified material, including fossils of tree species no longer indigenous to Alaska, are also of special scientific interest. Bear and waterfowl hunting opportunities exist at the head of Port Camden. Here canoeists/kayakers can cross into the Bay of Pillars by using the Bay of Pillars Portage Trail or into Three-Mile Arm using that portage. These portage routes have been identified as high visual sensitivity, reflecting the scenic expectations of visitors using these access routes. Dispersed camping occurs near the trailheads. Future recreational use may be influenced by the development of the Slippery Creek Fishpass. Pristine opportunities for lake and stream fishing exist at Slippery Lake. An impromptu recreation site at the head of Port Camden adjacent to the road system has been developed by former residents of Rowan Bay, and contains an anchorage, primitive boat ramp, and a good beach.

The landscapes in this VCU vary from rolling forested hills to steeper walled slopes and alpine peaks at the head of the bay adding visual variety for those traveling the 14-mile saltwater passage through the bay. Past timber harvest is dominant as seen from the head of the bay, near the isthmus to Three-Mile Arm and along the north side near the isthmus to the Bay of Pillars. The entrance to Port Camden is in a natural condition. The peak located furthest south in the head of Port Camden is unique with its views of alpine character, waterfalls and avalanche chutes cascading to lower elevations.

There are 3 units located midslope on the West Side of Port Camden. These units are visible in the middleground from the center of the bay, and to a lesser degree from other locations in the bay.

**Alternatives 2 and 5:**

Both these alternatives are identical in harvest design and treatment. Units 420-46, 47, and 48 are proposed for clear-cut harvest extending development further into Port Camden. These units were designed not to dominate the characteristic landscape and achieve the Modification VQO.

**Alternatives 3 and 4:**

Alternatives 3 and 4 are identical in visual effect proposing partial harvest treatment for Units 420-46, 47, and 48 with a less than 10 acre area of Unit 420-48 being clear-cut. These alternatives would both achieve a Partial Retention VQO.

**Cumulative Effects:**

Timber harvest along the east-facing ridge appears evident upon entering Port Camden. Management activities would be apparent throughout the VCU with future timber harvest entries. Harvest activities located at the head of the bay and east and west sides would dominate the landscape.

**West Fork Kadake Units**

Excellent steelhead, trout, and salmon fishing are possible in the waters of Kadake Creek. Bear and waterfowl hunting occur throughout Kadake Bay. Much of the use is associated with an existing Forest Service public recreation cabin located at the mouth of Kadake Creek in Kadake Bay. Boats can anchor near the bay entrance or at Gill Harbor to the north, which also contains an excellent salmon fishery. This area receives moderate to high use by residents of Kake for subsistence fishing purposes.

Landscapes in this area are typical of those on Kuiu Island. Entering the bay, the traveler passes through a 1,300 foot opening that expands to 1.5 miles wide once inside the bay. The Kadake Bay Forest Service cabin is located on the south shore of the bay. Views in the area

are expansive, and there is evidence of past timber harvest in the Kadake Creek area. The tideflats are a dominant feature, and the rise and fall of tides determine visitor access.

Alternatives 2, 3, 4, and 5:

Units 421-49, 50, and 51 are similar in visual effects as not being visible from any identified Visual Priority Travel Route and Use Area. All units are located outside the proposed Kadake Creek wild and scenic river corridor. Areas outside the river corridor are to be managed according to the adjacent land use designation. Alternatives 3 and 4 differ from 2 and 5 by proposing partial harvest treatment of these units. All units in all alternatives achieve a higher VQO for this location than that Adopted in the Forest Plan.

Cumulative Effects:

Past, present and future logging would result in a landscape dominated by timber harvest opening of various ages, design characteristics, and sizes.

## Other Viewing Areas

Other viewing areas would include those not identified as visually sensitive, or seen from established Visual Priority Travel Routes and Use Areas. These locations are classified as “seldom-seen”, and are managed with less visual emphasis than those areas with higher sensitivity. For these areas, the Maximum Modification VQO would apply.

## Summary of Environmental Effects

The four action alternatives would have varying degrees of scenic impact to the landscapes of Kuiu Island. The selected units under each alternative are fundamentally similar, the variation relating to scenic effects are primarily a result of the silvicultural treatments. Alternatives 2 and 5 propose development using a predominantly clear-cut harvest method and would have the most visual impact and greatest cumulative effects of all the alternatives. Timber harvest would dominant the characteristic landscapes where viewed from seen areas. Alternative 3 mix clear-cutting and partial harvest methods and achieve a less impacting effect that in Alternatives 2 and 5. Alternative 4 would have the least direct and cumulative visual effects by proposing predominantly partial harvest treatment for all seen areas. The design of this alternative would result in a natural appearing character in all viewing locations. Alternative 5 is similar to Alternative 2 but does not proposed harvest within the Security Bay viewshed. All alternatives would meet or achieve a higher Adopted Visual Quality Objective as identified in the Forest Plan.

**Alternative 1** (No Action) would benefit the developed landscapes of north Kuiu Island by proposing no action. No development would occur allowing further regeneration of units previously harvested. Those landscapes in visually sensitive areas currently dominated by timber harvest would recover to a more natural appearing condition.

**Alternative 2** Generally, activities that are proposed in Alternative 2 would be consistent with the overall theme of maximizing timber volume. Clear-cutting harvest further develops this regime in areas already visually dominated by timber management. Expansion of development in areas west of Rowan Bay would occur. Extension of the road on the western side of Port Camden would expand visibility of harvest from this body of water. In all other areas, further development of harvest would not significantly alter the landscape beyond what currently exists. Visual Quality Objectives ranging from Partial Retention to Maximum Modification would be achieved.

**Alternative 3** Proposes a mixture of partial harvest treatment and clear-cutting. Scenic impact would be slightly less visually that Alternative 2 as a result of fewer clear-cut units in the Rowan and Saginaw Bay viewing areas. Harvest visible from Port Camden would also be

noticeably less evident than Alternative 2 as a result of the fewer clear-cuts and units proposing alternative silvicultural harvest design. The scenery would appear modified but still resemble natural patterns to a great extent. Visual Quality Objectives ranging from Partial Retention to Modification would be achieved.

**Alternative 4** The primary objective of Alternative 4 is to emulate natural disturbance patterns in the landscape. Alternative 4 would have the least visual change of any “action” alternative. Textural changes in the landscape resulting from partial harvest appear less striking than the forms created by clear-cut openings. Visual Quality Objectives of Partial Retention to Modification would be achieved.

**Alternative 5** This is similar to Alternative 2 in scenic effects. The differences exist in proposing no harvest in the Security Bay VCU and two additional partial harvest units in the Rowan Bay viewshed. The additional harvest in the Rowan Bay area would not be a significant impact beyond that proposed in Alternative 2 since the added harvest would be partial cutting. Visual Quality Objectives achieved in this alternative would range from Partial Retention to Maximum Modification.



# Other Environmental Effects

## Recreation

Many of the recreation issues and concerns on North Kuiu Island center on the views from saltwater bays. These views affect local and non-local recreationists in small boats, yachts, and kayaks, cruise ships and also clients using the services of commercial outfitters and guides. The specific scenery issues are addressed in the Scenery section.

### Changes to ROS

To describe, identify, and quantify recreation settings, the Forest Service uses the Recreation Opportunity Spectrum (ROS). The ROS categorizes areas by their activities, remoteness, access, and experiences in a spectrum of classes from Primitive to Urban (See Glossary). The Crane and Rowan Mountain project area includes four of the seven classes in the Recreation Opportunity Spectrum: Roaded Modified, Semi-primitive motorized, Semi-primitive non-motorized, and Primitive.

Most areas proposed for timber harvest activities will not affect the existing recreation character. However, some change will occur near the Rowan Mountain area, where timber harvest will change about 150 acres from Primitive to Roaded Modified; about 450 acres from Semi-primitive Motorized to Roaded Modified; and about 900 acres from Semi-primitive non-motorized to Roaded Modified.

### Effects to Recreation Users

The Crane and Rowan Mountain timber sales are not expected to noticeably change the recreation experience for Kuiu Island users. Areas used for recreation are generally along the shoreline where no timber harvest is proposed.

Outfitters and guides also use Kuiu Island. In 1997, 34 permits were issued that identified Kuiu as part of their operating area. As with other recreation uses, there are no effects anticipated to outfitters and guides. Levels of outfitter and guide uses that may be allowed and described in the Stikine Area Outfitter and Guide Environmental Analysis will not change as a result of this timber sale.

## Soils

There will be little or no difference in effect on soils between alternatives, since all high hazard soils have been avoided, and soils management practices are applied to all alternatives. All alternatives are expected to equally meet or exceed Soil Quality Standards (USDA Forest Service, 1992b), and therefore, have no measurable adverse effect on the long-term productivity of the soil. Specific soils concerns and applied management practices are described on the road and unit cards in Appendix A.

### Soils Management Practices

Soils management practices applied to all roads and units in each alternative include:

- Partial suspension of logs (lead end of log suspended above the ground) is recommended on all cable yarding settings. This is primarily to prevent displacement of the nutrient rich, surface soil layers.
- Full suspension of logs (both ends of the log suspended above the ground) by skyline cable systems or helicopter is designated where needed to prevent excessive erosion or landslides.
- Shovel yarding is designated on gently sloping soils that have thin easily disturbed surface soils. This is to minimize displacement of organic horizons and exposure of mineral layers that could result in the establishment of brush species such as alder and/or salmonberry to the detriment of conifer regeneration.
- Roads are designed to maintain the natural drainage pattern to prevent excessive instream erosion and detrimental changes in soil drainage.
- Length and width of temporary spur roads are to be kept to a minimum to reduce the amount of forestland taken out of production.
- All disturbed areas of bare mineral soil will be revegetated by application of the prescribed grass seed and fertilizer during the next growing season.

### Caves and Karst

A portion of the project area in the vicinity of Saginaw Bay south to Kadake Bay consists primarily of carbonate rock. This area does contain karst features and some caves. (USDA Forest Service, 1997c) However, no activities are proposed in this karst area in any alternative.

### Wetlands

Wetlands are valued for their physical, chemical and biological functions. Physical functions include flood conveyance, surface and ground water regulation, sediment retention and temperature moderation. Chemical functions include nutrient storage, pH moderation, and carbon storage. Biological functions include habitat for terrestrial, aquatic, and marine plants and animals, as well as wood fiber production.

Like much of Southeast Alaska, Kuiu Island contains a large proportion of wetlands. Approximately 29 percent of the project area is classified as wetland as defined by the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (USCOE, 1987). Resource values associated with these wetlands vary greatly depending on characteristics such as the type of wetland, proximity to water bodies and landscape position. Different wetland types are found from sea level to alpine within the project area and are described as follows.

#### Wetland Types

##### **Muskeg (3,066 acres)**

Bogs (commonly called muskegs) are dominated by sphagnum moss with a wide variety of other plants adapted to very wet, acidic, organic soils. They typically contain some stunted lodgepole pine trees less than 15 feet high. These wetlands function as areas for recharge of groundwater and streams and for deposition and storage of sediment, and nutrients. They are a valuable source of biological and vegetative diversity. Muskegs are most commonly found in broad valley bottoms and on rounded hilltops.

Alpine/Subalpine Muskeg (10,363 acres) – Vegetation is a combination of muskeg and sedge meadows on peat deposits, and low growing blueberry and heath on higher rises. Stunted lodgepole pine and mountain hemlock is common. These wetlands are important for snow storage and can be a source for snowmelt water throughout the summer. They also provide summer habitat for terrestrial wildlife species. These wetlands are located at elevations of 1200 to 2500 feet

**Sedge Fens (2,275 acres)**

A diverse community of sedges and forbs characterizes fens and occasional stunted trees, usually spruce or hemlock. They occur in landscape positions where they receive some runoff from adjacent slopes resulting in somewhat richer nutrient status than bogs. These wetlands function as areas for recharge of groundwater and streams, deposition and storage of sediment and nutrients, and for waterfowl and terrestrial wildlife habitat, including black bear, mink, river otter, and beaver.

**Forested Wetlands (7,586 acres)**

Forested wetlands include a number of forested plant communities with hemlock, cedar, or mixed conifer overstories, and ground cover consisting largely of skunk cabbage and deer cabbage. These wetlands function as recharge areas for groundwater and streams, and for deposition of sediment and nutrients. They also produce commercial forest products.

**Estuarine Wetlands (840 acres)**

Estuaries are unique brackish environments where fresh water mixes with salt water. They are the most valuable wetland in the project area supporting complex and productive ecosystems for critical fish and wildlife habitat. Grasses and sedges, especially tufted hairgrass, Lyngby's sedge, and dune wild rye are the dominant species in the upper tidal zone. Common plants on the upper beaches include beach-carrot, beach pea, large headed sedge, paintbrushes, and lupine.

**Muskeg/Forested Wetland Mosaic (20,707 acres)**

Small patches of muskegs and forested wetlands as described above arranged in a mosaic pattern on the landscape. These areas have vegetative properties of each of the respective components but function somewhat differently in respect of habitats due to their small size and spatial arrangement.

**Forested, Wetland/Upland Mosaic (88 acres)**

Small patches of forested wetland as described above arranged in a mosaic pattern with forested non-wetland ecosystems. The forested wetland portion is typically on concave positions in these gently sloping or rolling landscapes.

The Forest Service, as well as other federal agencies, is required by Executive Order 11990 to preserve and enhance the natural and beneficial values of wetlands when carrying out their land management responsibilities.

The potential impact to wetlands is indicated by the amount of forested wetlands proposed for harvest. Harvest of forested wetlands is proposed on mineral soils only. Harvest on organic soils is not included in any alternative. (TLMP Record of Decision, 1997)

All roads in the project area are designed and used solely for silvicultural purposes. It is unlikely these roads will be used for other purposes because they are not connected to any community or ferry system. The amount of road proposed on wetlands is displayed in Table 3-17. Roads and harvest units were designed to minimize potential impacts to high value wetland areas since it is not possible to avoid all areas classified as wetland. These roads are located on forested wetlands or on forest/muskeg complexes where it is not practical to locate them on adjacent uplands. See road cards (Appendix A for details of road location relative to

wetland. Wetland vegetation, soil drainage, or hydric character of a wetland will not be measurably altered by road construction except for the width of the road fill itself. The area covered by the road prism is normally about 24 feet wide and amounts to approximately 2.9 acres per mile.

**Table 3-17 Miles of Roads Proposed on Wetlands**

	Existing Roads	Alt. 1	Alt. 2	Alt 3	Alt 4	Alt. 5
Muskeg	6.8	0	0	0	0	0
Sedge Fen	3.8	0	0	0	0	0
Forested Wetland	11.3	0	0.3	0.3	0.3	0.3
Estuarine Wetland	0	0	0	0	0	0
Subalpine Forested Wetland Mosaic	0	0	0	0	0	0
Muskeg Forested Wetland Mosaic	27.6	0	1.8	1.8	0.1	1.4
Forested Upland Wetland Mosaic	0	0	0.1	0.1	0.1	0.1
Total	49.5	0	2.2	2.2	1.8	1.8

## Floodplains

The Executive Order 11988, dealing with floodplain management, was largely intended to reduce the risk of property loss, minimize the impact of floods on human safety, health and welfare; and to restore and preserve the beneficial values served by floodplains. None of the proposed alternatives would result in human occupancy of floodplains. Because the proposed action would have no floodplain development other than stream crossings, there will be no anticipated loss of property values, nor will human health, safety, or welfare be adversely affected. In general, road location, construction measures, drainage structures, and timber harvest will have minimal effect on the natural or beneficial values of the floodplains.

## Fisheries

The project area, approximately 160,000 acres, is divided into 7 VCU's and contains 196 watersheds. There are at least 750 miles of stream in the project area and 468 acres of lakes. Descriptions of the fisheries for each drainage have been included in the watershed section.

Two types of stream classification systems have categorized streams. One classification, recognizes four stream classes and is defined by the Regional Aquatic Habitat Management Handbook as follows:

- Class I--- Streams with anadromous or adfluvial fish habitat; or high quality resident fish waters listed in Appendix 68.1, Region 10 Aquatic Habitat Management Handbook (FSH 2609.24), June 1986; or habitat above fish migration barriers known to provide reasonable enhancement opportunities for anadromous fish.
- Class II--- Streams with resident fish populations and generally steep (6-15 percent) gradient (can also include streams from 0-6 percent gradient) where no anadromous fish occur, and otherwise not meeting Class I criteria. These populations have limited fisheries values and generally occur upstream of migration barriers or have other habitat features that preclude anadromous fish use.
- Class III--- Perennial and intermittent streams with no fish populations but which have sufficient flow or transport sufficient sediment and debris to have an immediate influence on downstream water quality or fish habitat capability. These streams generally have bankfull widths greater than 5 feet and are highly incised into the surrounding hillslope.
- Class IV--- Other intermittent, ephemeral and small perennial channels with insufficient flow or sediment transport capabilities to have an immediate influence on downstream water quality or fish habitat capability. These streams generally are shallowly incised into the surrounding hillslope.
- Non-streams--- Rills and other watercourses, generally intermittent and less than 1 foot in bankfull width, little or no incision into the surrounding hillslope, and with little or no evidence of scour.

There are 253 miles of Class I, 82 miles of Class II and 411 miles of Class III stream in the project area. The Class IV stream is a new class and due to their small size and short length they will be identified and mapped at the project level for the affected area.

The other classification system is based on channel morphology and is defined by the Region 10 Channel Type Users Guide. This classification system uses nine fluvial process groups and 38 individual channel types to describe stream reaches. All but the Glacial Outwash Process Group are present on Kuiu Island.

ES	ESTUARINE PROCESS GROUP
PA	PALUSTRINE PROCESS GROUP
FP	FLOODPLAIN PROCESS GROUP
GO	GLACIAL OUTWASH PROCESS GROUP
AF	ALLUVIAL FAN PROCESS GROUP
LC	LARGE CONTAINED PROCESS GROUP
MM	MODERATE GRADIENT MIXED CONTROL PROCESS GROUP
MC	MODERATE GRADIENT CONTAINED PROCESS GROUP
HC	HIGH GRADIENT CONTAINED PROCESS GROUP

Appendix B contains descriptions and photos of each process group.

### Stream Classification

### Fish Production

North Kuiu contains only 26% of the area of Kuiu Island yet has the capability to produce 46% of the pink salmon and 56% of the coho salmon on Kuiu Island. This can be attributed to a higher proportion of floodplain and moderate gradient mixed control channel process groups than other areas of Kuiu Island (USDA Forest Service, 1997b).

With the implementation of the TLMP Riparian Standards and Guidelines there is not expected to be any decrease in the habitat capability due to timber harvest by any alternative. Site specific stream buffer width information has been included on the unit cards (Appendix A) to insure proper protection of the fisheries resources.

### Riparian Management Areas

The Riparian Management Area is defined as land areas delineated in the Forest Plan, to provide for the management of riparian resources. Specific standards and guidelines, by stream process group, are associated with the riparian management areas and are displayed in Appendix B.

### Prior Timber Harvest

A number of Class I and II streams have been affected by past timber harvest activities. Saginaw, Kadake, Browns, and Rowan Creeks have had the most harvest in the riparian zone. Table 3-18 shows that Security Creek has had only 29 acres harvested within 100 feet of Class I streams and 99 acres harvested between 100 and 300 feet of Class I streams (USDA Forest Service, 1997b).

**Table 3-18 Area Harvested within 300 Feet of Class I Streams**

Watershed	Acres Within 100 feet	% Within 100 feet	Acres Between 100-300 feet	% Within 300 feet	Total Area Within 300 feet
West Fork Kadake	26	2	103	8	1,260
Whole Kadake	100	2	394	8	5,164
Security	29	8	99	12	839
Dean	7	1	69	8	806
Unnamed North	No Existing Harvest				
Unnamed South	No Existing Harvest				

### Stream Buffers and Windthrow

In 1995 the Petersburg Ranger District randomly sampled 31 stream buffers adjacent to units harvested between 1968 and 1993 on Kuiu Island, representing approximately 10 miles of buffer. The amount of blowdown in the buffers, calculated as the percentage of the blowdown basal area compared to total buffer basal area, varied from 1 percent to 66 percent with a mean of 17 percent. Seventy-six percent of all blowdown occurred in the outer 65 feet of the buffer and 22 percent was within the stream. For each downed tree the azimuth, species, length, dbh and location within the buffer was recorded. (USDA Forest Service, 1995b)

A GIS wind disturbance inventory of Kuiu Island contains information on historical wind events as far back as 500 years and also contains wind direction where available. In addition, Mark Kramer, a graduate student from Oregon State University, has developed a windthrow hazard map for Kuiu Island, which displays high, medium and low windthrow categories. This information has been incorporated into unit design and displayed on the unit cards. It

will be used to design reasonably windfirm buffers in the future and along with continued effectiveness monitoring will help increase our understanding of the affect of wind upon stream buffers.

Roads

There is little difference between alternatives in both the length of new road construction and the number of stream crossings. Table 3-19 shows that none of the alternatives propose new roads crossing Class I streams and there are only a few Class II stream crossings none of which will require road construction timing clauses to protect downstream Class I fish habitat. The 46041 road crosses the most Class 2 and 3 streams but is proposed for all the action alternatives.

Table 3-19 Number of Stream Crossings by Alternative

Stream Class	Alternative 2	Alternative 3	Alternative 4	Alternative 5
I	0	0	0	2
II	2	2	2	2
III	15	15	13	13

Subsistence

Subsistence

Subsistence hunting and collecting of resources plays an important role in the lives of the region’s rural residents. It reflects deeply held beliefs, values, and attitudes. Many subsistence-gathering activities are social events for families and communities. Resource gathering activities include hunting, fishing, digging for clams, catching shellfish, gathering firewood and collecting other food items such as berries and herring eggs. Major resources used for subsistence are deer, salmon, halibut, crab, clams, berries and waterfowl (Kruse and Muth 1990).

About one-third of the rural communities of the region take at least half of their meat and fish by hunting and fishing (Holleman and Kruse 1991). Sitka black-tailed deer are an important subsistence resource for Southeast Alaskan rural residents. Over one-third (37 percent) of all rural households harvest at least one deer. Other mammals other than deer account for only four percent of the total harvest of edible subsistence resources. These mammals include moose, black bear and furbearers. Only Alaskan Natives are allowed to harvest marine mammals for subsistence. Harbor seals account for three percent of their total subsistence harvest.

Congress defined subsistence use and subsistence preferences when it passed the Alaska National Interest Lands Conservation Act (ANILCA). Section 810 of ANILCA defines subsistence use as: “The customary and traditional uses by rural Alaska residents of wild renewable resources for direct, personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of non edible byproducts of fish and wildlife resources taken for personal or family consumption; for barter, or sharing for personal or family consumption; and for customary trade.”

ANILCA states that “the continuation of the opportunity for subsistence uses by rural residents of Alaska, including both Native and non-Native, on the public lands and by Alaska Natives on Native lands is essential to Native physical, economic, traditional, and cultural existence and to nonnative physical, economic, traditional, and social existence.”

ANILCA also states, under Section 804, that “customary and traditional” subsistence uses of the renewable resources “shall be the priority consumptive uses of all such resources on the public lands of Alaska.” This means that rural residents have first priority to public subsistence resources when demand for these resources exceeds the supply. All people living in Southeast Alaska, except those living in Juneau and Ketchikan (approximately 40 % of the population), are considered “rural” residents.

Section 810 of ANILCA requires a Federal agency, having jurisdiction over public lands in Alaska, to analyze the potential effects of proposed land-use activities on subsistence uses and needs. An ANILCA 810 analysis includes:

1. An evaluation of the possibility of affects on subsistence uses
2. A distinct finding on whether the proposed action may significantly restrict subsistence uses.
3. Notices and hearings if the evaluation results in a restriction determination.

Evaluation criteria used to assess the effects of the proposed alternatives are:

- Changes in abundance or distribution of subsistence resources,
- Changes in access to subsistence resources, and
- Changes in competition from non-subsistence users for those resources.

The evaluation determines whether subsistence uses within the analysis area, or portions of the area, may be significantly restricted by any of the proposed action alternatives. Wildlife, fish, shellfish, marine mammals, other foods and timber are the resources used for subsistence that are evaluated in this subsistence report. A Subsistence Specialist Report has been completed and is in the planning file.

Regardless of technological innovations that allow Native residents the option of ranging over a wide area, their use is still focused on traditionally claimed areas or boundaries recognized prior to the arrival of Euro-Americans. On the other hand, non-Native use patterns tend to be more opportunistic and often widely dispersed throughout the region.

Traditionally, Kuiu Island is an important deer harvest area. Within the project, area the most used areas for deer hunting include Security, Saginaw, Kadake, Rowan Bays, Bay of Pillars, and Port Camden. Use has been limited in recent years however, due to very low deer numbers. The Alaska Board of Game closed deer hunting on Kuiu Island in 1975 after severe winters decimated the deer herd. The closure was lifted in 1992. We expect hunting to increase in traditional areas as deer numbers increase.

Estuaries within these bays provide important habitat for waterfowl; the tidally exposed sediments provide important shellfish habitat. These bays have important salmon runs, which support abundant wildlife resources.

Much of the beach fringe has been used for subsistence resource gathering activities. This coastal area or beach fringe has been identified in the Forest Plan as the area generally located from mean high tide inland to a 1000-foot slope distance. In addition to the beach fringe, other important use areas may be located as much as three to six miles from the coastline (TRUCS, 1988).

Kake responded to the Draft Environmental Impact Statement expressing their concerns about subsistence resources on Kuiu Island. We recognize the importance of North Kuiu Island in its traditional subsistence uses by the community of Kake. In 1987, the per capita household subsistence harvest in Kake was 159 edible pounds. About 91 percent of all households

### Subsistence Use

### Kake

harvested some subsistence resource. The most common resources used (by over 50 percent of households) were coho, Chinook and sockeye salmon, halibut, herring roe on kelp, deer, seal, Dungeness crab, clams and cockles, chitons, berries, seaweed and wood (TRUCS 1988).

Of the 159 edible pounds harvested, deer represented 24 percent, salmon 22 percent and finfish other than salmon 21 percent. These were the most important subsistence resources for Kake households (Kruse and Frazier, 1988). Kake hunters travel an average of 28 miles to their most reliable deer hunting areas. The majority of Kake's deer harvest comes from Wildlife Analysis Areas 3939 and 3940 at the southern portion of Admiralty Island. The average number of deer harvested in Wildlife Analysis Area (WAA) 3940 was 92 deer and WAA 3939 was 46 deer (ADF&G, 1994).

The Forest Service recognizes that Kake hunters traditionally use Kuiu Island for their hunting grounds. We expect they will slowly return to their traditional hunting grounds in WAAs 5012, 5013, 5014 and 5018 as deer populations continue to recover. These areas are closer to Kake than those on Admiralty Island and travel to Kuiu Island is much easier and safer during the winter months.

Maps showing subsistence use areas of all the communities using Kuiu Island for subsistence are available in the Subsistence Report in the planning record.

## Effects of Alternatives

### Abundance and Distribution Sitka Black-tailed Deer

The evaluation of the potential effects on subsistence resources is based on a comparison of the estimated supply with the anticipated demand. The availability of deer is estimated using the interagency deer model (TLMP 1997) to determine the number of deer that the available habitat is capable of producing for a given time. The subsistence demand for deer is estimated based on historical harvest data as adjusted for anticipated increases in the rural population. This analysis is conducted for each wildlife analysis area (WAA) on Kuiu Island and provides an estimate of the potential number of deer available for harvest. The number of deer that the habitat is capable of producing is compared to the estimated subsistence demand. If the demand for deer exceeds the supply, then a "significant possibility of a significant restriction" exists.

It is assumed that subsistence resource use will continue into the foreseeable future by communities with historical use of the study area. In 1960, census data for Kake, Klawock, Petersburg, Point Baker, Port Alexander, Port Protection, Sitka, and Wrangell indicated a total 6778 individual resided in these communities. Hunter populations are determined from data supplied by the Alaska Department of Fish and Game, Division of Wildlife Conservation estimates for each of the above communities

Alaska Department of Fish and Game (1991) estimates "an average of approximately 200 deer were killed on Kuiu annually in the 1960's". It is assumed these 200 deer represent 100% of the subsistence demand in 1960, for deer on Kuiu Island.

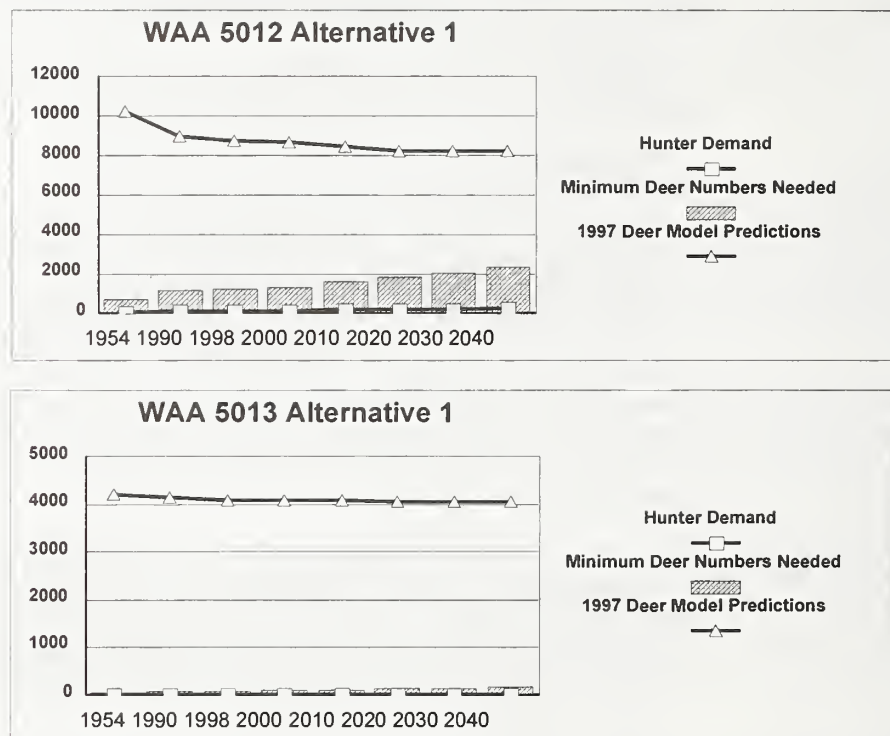
The following criteria and assumptions were used in this analysis:

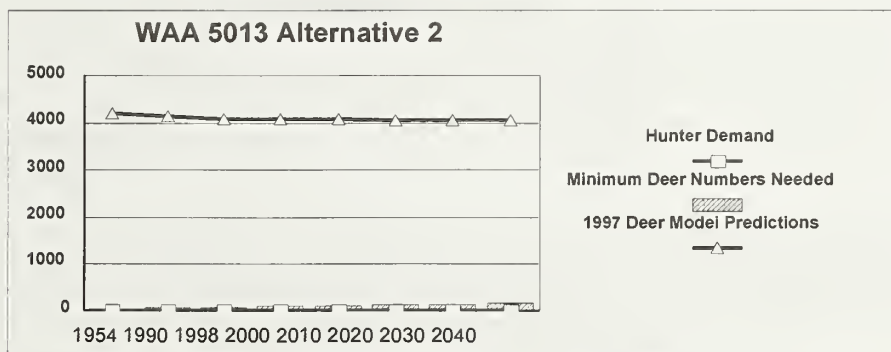
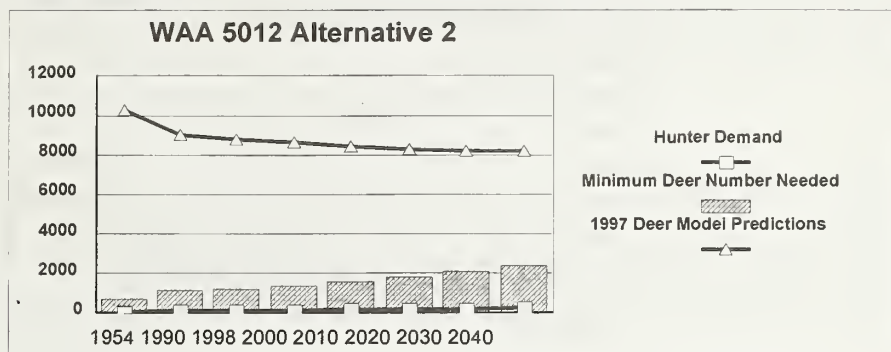
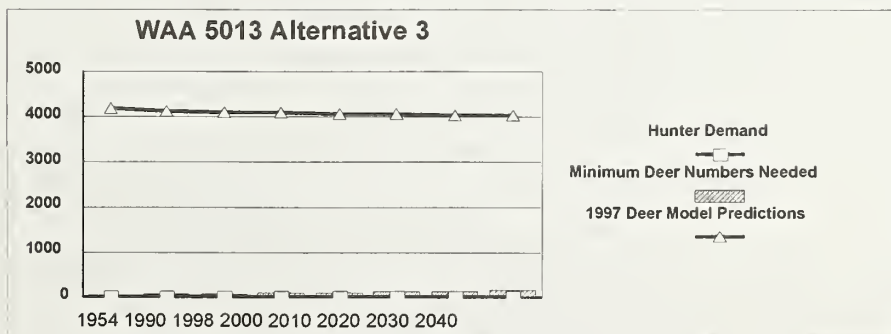
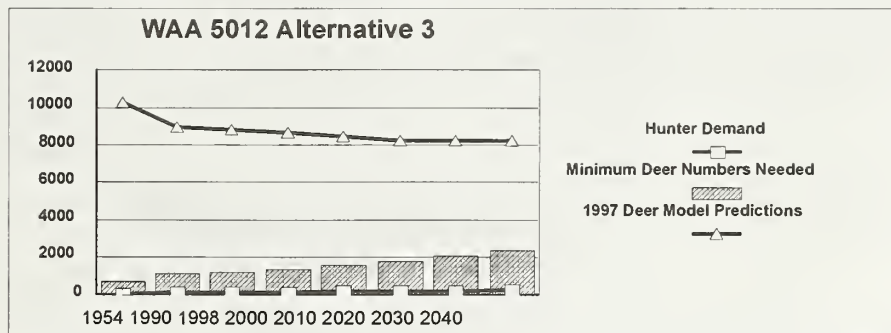
1. The habitat capability model (TLMP 1997) is used to estimate the capability of the available habitat to provide deer.
2. Hunter demand is estimated using the Strategic Management Plan for Deer, ADF&G 1991. An 18 percent growth rate (per decade) in hunter population is assumed for years 1990-2010. A 15 percent growth rate (per decade) in hunter population is assumed for years 2010-2040.

3. The number of deer needed for a huntable surplus is calculated at 10 times hunter demand (ADF&G 1991).
4. The 1960 harvest is assumed to be 100 percent subsistence use. The area was not used for sport hunting by non-rural hunters.
5. All the communities that use Kuiu Island for subsistence are included in the analysis.
6. The analysis includes years 1960 through 2040.
7. Model outputs are reduced by 25 percent to account for wolf predation on deer (Person et al 1996 and 1997).

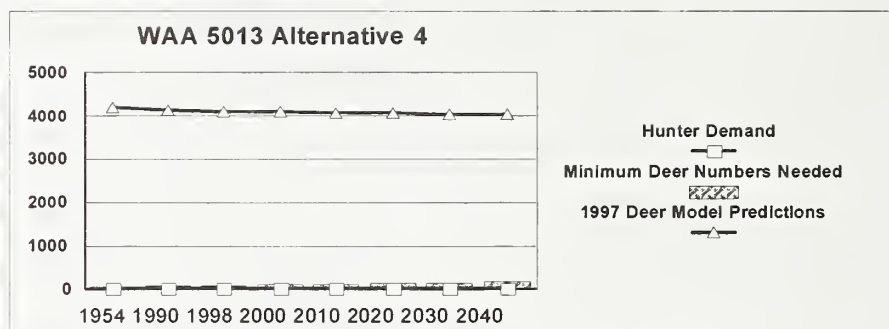
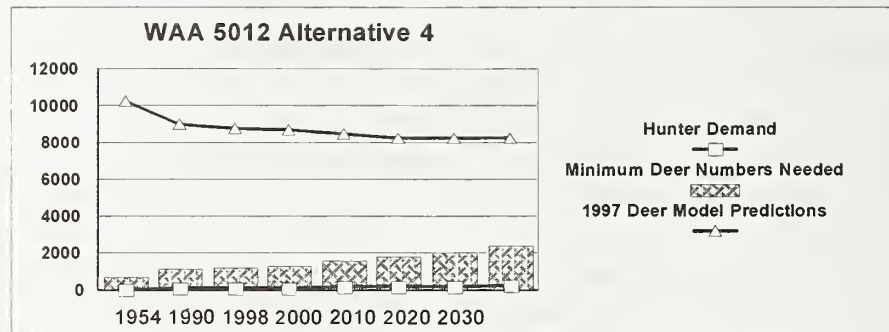
The following tables display the results of this analysis for each alternative and for each WAA within the project area.

**Table 3-20 Deer Demand in Alternative 1 by WAA**

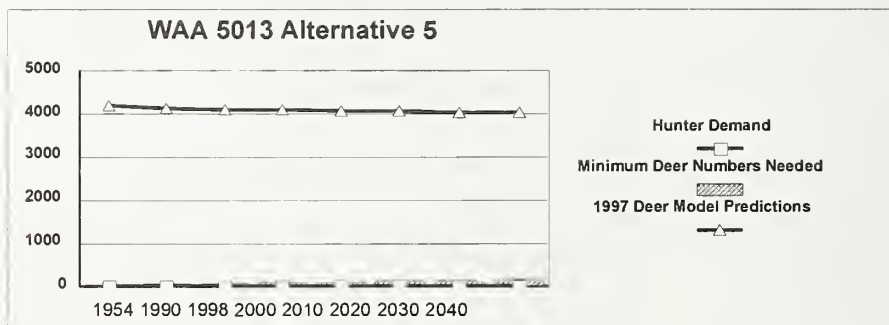
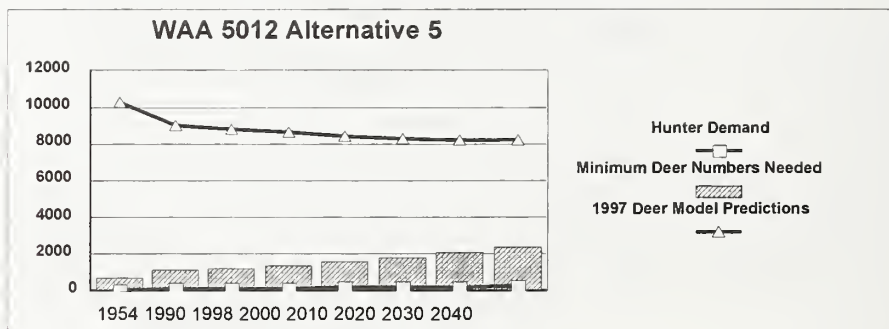


**Table 3-21 Deer Demand in Alternative 2 by WAA****Table 3-22 Deer Demand in Alternative 3 by WAA**

**Table 3-23 Deer Demand in Alternative 4 by WAA**



**Table 3-24 Deer Demand in Alternative 5 by WAA**



**Access**

Access to traditional subsistence use areas has not been restricted by land use activities and will not be substantially affected by any of the action alternatives. Additionally, projected effects in the foreseeable future are not expected to change. This conclusion is based on traditional means of access (i.e., foot, boat, and floatplane).

The developed road system allows seasonal access too much of north and east Kuiu Island. The existing roads will continue to provide access to the area. Presently, the only means of transporting motor vehicles to the island is by boat or barge. The Alaska Marine Highway System does not serve the island and is not expected to do so in the foreseeable future. The proposed roads will have little or no effect on access since they all will be closed when logging is completed (see the Road Access Management Prescriptions in Appendix A).

**Competition**

The subsistence and sport-hunting season for deer on Kuiu Island reopened in 1992. Competition for deer on Kuiu Island is not expected to rapidly increase. The Federal Subsistence Board has determined all of the communities with historical subsistence use of deer on Kuiu Island rural. This qualifies them for subsistence harvest on Kuiu Island. The Federal Subsistence Board has the authority to restrict the subsistence and sport harvest of deer should the need arise.

A substantial increase in competition for subsistence wildlife resources from non-rural community residents is not projected to result from any of the proposed alternatives. This is because it is difficult and expensive for non-rural residents and out-of-state hunters to access Kuiu Island. It is likely to remain this way the life of the proposed project.

Black bears, and possibly wolf, are the only known wildlife resources currently being harvested on Kuiu Island by non-rural and out-of-state residents. Since 1985, nonresident hunters, usually guided by outfitters, have taken 58 percent of the black bear harvested on Kuiu Island. There has been no direct comments in any ANILCA 810 Hearing testimony to indicate that competition for black bear by the nonresident hunters and non-rural Alaskan residents is affecting the ability of rural community residents to harvest black bear.

There could be an increase in short-term competition from individuals associated with the Rowan Bay logging camp. Past hearing testimony from Kake indicates that people from the Rowan Bay were harvesting waterfowl. They may have also harvested furbearers and black bear. However, there is no longer a permanent community at Rowan Bay. The logging camp will likely be occupied only intermittently during the timber harvest activities.

People who testified at past Point Baker and Kake hearings expressed concern that increased competition from loggers for subsistence wildlife resources would affect their ability to harvest those resources. This previous testimony by residents of Point Baker and Kake focused on alternatives, which proposed to construct a log transfer facility, logging camp, and a log-chipping facility at No Name Bay. Kake testimony focused on the cultural and subsistence use of the northern portion of Kuiu Island. Their primary concern was the protection of Security Bay's "Fall Dog Creek" which is now protected by a non-development land use allocation in the Forest Plan. None of the alternatives proposes any action along the West Side of Security Bay.

**Subsistence Finding:**

Using the information gathered from the Tongass Resource Use Cooperative Survey (TRUCS), comments from previous Alaska National Interest Land Conservation Act ANILCA 810 Subsistence Hearings, and other relevant cultural and socioeconomic sources, the Forest Service makes distinct Subsistence Findings by alternative and by resource category, whether there may be a significant restriction of subsistence use. The resource

categories evaluated are deer, other important wildlife, fish, other foods, and timber. Because of its regional significance as a resource used for subsistence, deer are evaluated separately. As indicated earlier, the evaluation considers the effects by alternative on (1) abundance or distribution, (2) access, and (3) competition for each resource category.

The Alaska Land Use Council's definition of "significantly restrict subsistence use" is one guideline used in this evaluation. The definition is: "A proposed action shall be considered to significantly restrict subsistence uses, if after any modification warranted by consideration of alternatives, conditions, or stipulations, it can be expected to result in a substantial reduction in the opportunity to continue subsistence uses of renewable resources."

The US District Court Decision of Record in *Kunaknana vs. Watt* provided additional clarification. In part it stated: "Restrictions for subsistence uses would be significant if there were large reductions in abundance or major redistribution of these resources, substantial interference with harvestable access to active subsistence-use sites or major increases in non-rural resident hunting."

This means that if there is no restriction to subsistence uses (or slight inconvenience) when harvesters can reach and use active subsistence harvesting sites; and no substantial increase in competition for harvestable resources exists (that is, no substantial increase in hunting by non-rural residents) then no restriction to subsistence resources exists.

Conversely, restrictions for subsistence uses would be significant if there were large reductions in the abundance or the major distribution of these resources, substantial interference with harvestable access to active subsistence sites or major increases in (non-rural) resident hunting.

In light of this definition the determination of significant restriction must be made on a reasonable basis, since it must be decided in light of the total subsistence lands and resources that are available to individuals in surrounding areas living a subsistence lifestyle.

The intent of the subsistence evaluation is to find out whether any proposed alternative may significantly restrict subsistence uses within the analysis area. The findings are based on whether the proposed alternatives would have a measured effect on subsistence users in the foreseeable future.

Although there may be some short-term changes in access, we do not expect that the temporarily increased access would reduce subsistence harvests below historic levels, and the habitat capability should be sufficient to meet the increased demand for deer. All action alternatives will close the roads built under this EIS. Since this road system is not tied to the State Ferry System and no permanent towns or villages are located on Kuiu Island, the road system is used very little except for logging activities. A substantial increase in competition for subsistence wildlife resources from non-rural community residents is not projected to result from the alternatives proposed.

Several responses received during public involvement efforts for this project questioned the changes to subsistence effects predicted in the North and East Kuiu project and those predicted in the Crane and Rowan Mountain DEIS. The simple answer to this question is that the geographic areas analyzed by each of these projects is significantly different, and new scientific information has become available and management direction was adopted since 1992, when North and East Kuiu project was completed.

In the North and East Kuiu FEIS we determined that there could be a “significant possibility of a significant restriction” to subsistence resources over the sale area. This determination was based on the analysis of deer habitat capability and hunter demand in WAAs 5014 and 5018. In North and East Kuiu we said that in these two WAAs the habitat capability “may not meet the projected hunter demand in the foreseeable future.” These two WAAs are not included in the Crane and Rowan Mountain project. Crane and Rowan Mountain project is located in WAAs 5012 and 5013.

From a management and science perspective, several post-1992 events have altered this project. The New Forest Plan has had a dramatic effect on the way resources are managed. When preparing the North and East Kuiu FEIS, data from the 1979 Forest Plan (as amended) and Alternative P (the preferred management alternative at that time) was used. Many of these standards and guideline have changed drastically with the implementation of the 1997 Forest Plan. Beach fringe buffers have been extended to 1000 feet, increased protection on riparian areas (Class 1, 2 and 3 stream buffers) exist, new Land Use Designations (wild, scenic and recreation river corridors; old growth strategy; remote/semi-remote recreation areas, etc.) have been adopted, a new deer model (TLMP 1997) was developed and the Conservation Assessments written for the 1997 Forest Plan (Iverson et al 1996; Person et al 1996; and DeGange 1996) were adopted. Additionally, the Kuiu Island Interdisciplinary team has taken a new course of action, that of using disturbance ecology principles for planning timber sales. These changes will increase habitat capability and lessen potential impacts to deer harvest.

Through the application of new management direction and scientific knowledge, and the careful analysis of the effects of the proposal on subsistence resources, I have determined that the habitat is capable of supporting populations greater than projected hunter demand for deer, other wildlife, fish, other foods and timber under all alternatives throughout the rotation.

**The project findings are that there will not be a “significant possibility of a significant restriction” on subsistence uses for deer, other wildlife, fish, marine mammals, other foods and timber resources.**

**This project together with other past, present or reasonably foreseeable future actions will not have a “significant possibility of a significant restriction” on these subsistence resources.**

## Marine Environment

Southeast Alaska has approximately 30,000 miles of shoreline. Along this length a great diversity of habitats account for the complexity of Southeast Alaska's estuarine and tidal environments.

The marine environment encompasses a wide variety of ecosystems. This section deals primarily with the intertidal and subtidal marine environments that are subject to effects from log transfer and storage facilities, since those are the points of concentrated activity associated with the marine transportation of logs. Activities outside the areas of concentration are widely dispersed and any potential effects would be short-term and/or diluted below detectable thresholds. This document describes the marine environment and current conditions at Rowan Bay and Saginaw Bay log transfer facilities (LTFs).

The shallow marine waters and associated mud flats that are found in the protected coves and bays provide vital habitat for some commercially important species, such as Dungeness crab, herring, and juvenile salmon. They are part of a complex and dynamic ecosystem that includes shrimp, flatfish, marine worms, starfish, sponges, anemones, sea cucumbers, urchins, shellfish, plankton, marine algae, and other organisms.

The potential impacts that are of concern at log transfer sites relate primarily to the deposition of bark. Laboratory tests show that bark deposits may be a source of toxic organic leachates that may be deleterious to salmon fry and crab larvae. The accumulated bark also smothers benthic organisms. The rate of bark accumulation varies with conditions at each facility. The design of the facility partially determines the amount of bark lost (loss of bark has been directly related to the speed of log entry into the water), and the configuration of the location determines the dispersion of the bark by currents and winds. Log raft storage areas accumulate bark at a much slower rate than the immediate area of the log transfer facility. Little quantified information is available that documents decomposition, flushing, recovery times, recolonization rates, or other information about the longevity of bark and its affects on the marine benthic habitat.

An effect of bark and debris accumulation is that littleneck clams and bay mussels have been shown to be eliminated when as little as 4 to 5 inches of bark accumulated (O'Clair and Freese 1984). Further, Conlan and Ellis (1979) reported mollusks and several polychaetes were excluded by bark debris greater than 2.5 centimeters in thickness, and the effects of bark may last several decades. Deposition of more than a 1-centimeter layer of wood waste has been observed to produce losses of suspension feeding benthos, with major community composition changes associated with a 5-centimeter accumulation (Conlan and Ellis 1979). In 15-centimeter deposits, suspension-feeding organisms were absent and the area was dominated by a few abundant deposit-feeding organisms. It can be assumed that other plants and animals that live in and on the bottom would be similarly affected.

The Rowan Bay and Saginaw Bay log transfer facilities (LTFs) have been in operation long enough that deposited bark is a feature of these sites. A SCUBA diving survey of bark debris at the Rowan Bay LTF was conducted during July and August 1990. Approximately 28 acres had a continuous coverage of bark greater than 10 centimeters deep and 6 of those acres had bark greater than 100 centimeters deep. The reported amount of bark in 1990 apparently increased from 1988 when the LTF was previously monitored. The SCUBA diver monitoring in 1990 indicated some difficulty determining the depth of bark debris over the soft natural substrate. This was because of poor underwater visibility and the difficulty of identifying the substrate by feel through dry suit gloves. In 1994, the EPA for bark accumulation at the LTF placed Rowan Bay on the Section 303d Tier 1 list. This list identifies water quality-limited water bodies, which require water quality assessments to verify the extent of pollution, and what controls are in place or needed. A dive survey conducted in 1996 found that the Rowan Bay LTF still exceeded the maximum zone and depth of deposit. Due to this bark accumulation, all future movement of logs through this transfer facility will be done on barges, eliminating the build up of more bark. Reconstruction of the bulkhead at the Rowan Bay LTF to accommodate barging is expected to occur in 1998.

The Saginaw LTF was inspected for accumulating bark in 1987 and 1988. Bark was present between the shore and an offshore rock ridge. Currents over and beyond the ridge appear to sweep the bark away. In 1988, inside the ridge, approximately 1 acre had a continuous coverage of debris more than 10 centimeters deep.

Freese (1987) indicates that once benthic deposits of bark are in place, they are very resistant to decomposition or transport away from the immediate area. In general, however, the area impacted by bark is relatively restricted. At 13 LTFs evaluated in Southeast Alaska, bark deposits average 2.4 acres per site (Freese, 1987).

Toxic substances occurring as leachates from bark precipitate in saltwater; therefore, leachates do not appear to be a major problem in open water or where good circulation exists (Sedell and Duval, 1985). Recently, dissolved substances, such as hydrogen sulfide and ammonia, have been shown to occur in the interstitial water of bark deposits when bark accumulates on the bottom (O'Clair and Freese 1984). If Dungeness crabs burrow into the bark deposit, the number of eggs produced is decreased, food habits change, and overall crab survival is decreased. It should be noted that this type of effect has been observed in only one bark accumulation in the field (Rowan Bay log transfer facility) and that, in general, crabs were not found in bark accumulations at a number of other log transfer facility locations. Studies have demonstrated that waste wood leachates in the water can be toxic in concentrated form to fish and shellfish, such as shrimp and salmon. However, in the natural environment, toxic concentrations should not be reached due to adequate flushing and circulation. Regulations requiring monitoring of bark and wood accumulation help quantify the effects in the zone of deposit.

Other effects associated with existing log transfer facilities relate to oil, grease, and petroleum pollution. The source of these contaminants may be the operation and maintenance of equipment used in log handling and transfer operations. Persistent loss of small volumes of petroleum products is a concern, as water soluble compounds have been shown to be toxic to marine larvae and eggs at concentrations of 0.1 mg/l. Daily monitoring for the presence of any visible oil sheen on the water is a standard condition for all new log transfer site permits.

## Rowan Bay

Following are descriptions of the marine environment for the two existing LTFs, Rowan Bay and Saginaw Bay:

Six catalogued anadromous fish streams enter Rowan Bay. Rowan Creek and Brown's Creek are the most important producers. Rowan Creek also produces substantial numbers of coho and chum salmon. Pink and chum salmon juveniles rear for 1 to 2 months in Rowan Bay each spring following emergence and migration from the streams.

Dungeness crab harvest for the combined Rowan Bay and adjacent Bay of Pillars for 6 years of reported data from 1969 through 1984 was 62,000 pounds. The exact division of the catch between Rowan Bay and the Bay of Pillars is unknown, but based on observations of the number of crab trap floats in Rowan Bay a substantial portion comes from Rowan Bay.

## Saginaw Bay

Four catalogued salmon producing streams enter Saginaw Bay with Saginaw Creek and Straight Creek being the largest producers.

Dungeness crabs are harvested in Saginaw Bay. The estimated catch has been with held because of State of Alaska nondisclosure regulations. For one year during the period 1969-'84 commercial harvest occurred for spot and coonstripe shrimp. Amount of harvest was again with held because of nondisclosure regulations.

### Summary of Effects

The impacts to the marine environment are expected to be minimal since the Saginaw Bay LTF will not be used and logs will be barged from the Rowan Bay LTF. Little additional impact to the marine environment would occur at Rowan Bay as this LTF is already constructed and has been previously used for watering logs. Bark has already accumulated on the bottom in front of this facility. Construction of the barging facility will require the addition of rock fill material in the area of the existing LTF.

Monitoring of the bark accumulation at both LTFs (a requirement of the current permits) indicates the bark accumulation covers approximately 28 acres at Rowan Bay and less than 1 acre at Saginaw Bay. The size of the bark accumulation is believed to be related to site characteristics of the individual LTFs more than to the volume of logs watered at the sites. (Schultz and Berg, 1976) monitored 32 LTFs and found no significant relationship between bark depth and the age of the LTF, volume of timber dumped, type of LTF, and other independent variables. They speculated tidal action, currents, and physical and chemical characteristics of the bottom influenced the amount of bark at an LTF.

Repeated monitoring at five LTFs on the Stikine Area, including Rowan Bay and Saginaw Bay, has indicated no obvious proportional relationship between the area of bark accumulation and the volume of logs watered at that site. In other words, doubling the volume does not double the area of the bottom covered by the bark. Monitoring results indicate that additional use of an LTF tends to increase the depth of the bark and likely covers a small amount of the presently bark-free substrate on the fringes of the previous bark pile. Additionally, the size of the pile may decrease during periods of non-use of the LTF.

## Heritage Resources

**Definitions**

**Culturally Modified Trees** - Culturally Modified Trees (CMTs) are trees that have been altered by people in the past. Usually this refers to the removal of strips of bark or other alterations made to the woody portion of the tree.

**Heritage Resources** - The physical remains of districts, sites, structures, buildings, networks, events, or objects used by humans in the past. They may be historic, prehistoric, architectural, or archival in nature. Heritage resources are non-renewable aspects of our national heritage.

**Historic Property** - Any heritage resource included in, or eligible for inclusion in, the National Register of Historic Places. The term includes artifacts, records and remains that are related to and located within such properties.

**State Historic Preservation Officer (SHPO)** - The official appointed or designated pursuant to Section 101(b)(1) of the National Historic Preservation Act of 1966, as amended, to administer the State Historic Preservation Program.

### Introduction

Kuiu Island heritage resources reveal a rich cultural heritage spanning the last several thousand years. Since 1974 archaeologists have completed reconnaissance and complete heritage resource surveys of various Forest Service activities on Kuiu Island. Detailed information about project surveys and known sites is contained in files at the Stikine Area Supervisors Office. Site records, especially those related to site location, are generally not available to the public because of the fragile nature of heritage resource sites. The following discussion summarizes the known project area heritage resources and describes field surveys conducted within the project area.

The types and frequencies of known and suspected heritage resource sites within the Kuiu Island project area are presented in Table 3-20. There are 35 project area sites (historic, indigenous and 14[h][1] sites) on the Alaska Heritage Resource Survey, a statewide listing of recorded heritage resources. None of these sites are listed on the National Register of Historic Places. Most of the sites are eligible for the National Register of Historic Places, however very few have been formally evaluated for eligibility. Additional 52 locations are suspected heritage sites, which have not been field verified, or former special use permit sites, which may be historic. In addition there are 20 locations applied for as Native allotments, which may represent former sites. None of these sites are in or near areas of proposed direct impact (e.g. harvest units, roads, etc.).

**Table 3-25** Types and Frequencies of Project area Heritage Resource Sites

VCU	SUP	NA	SS	HS	14(h)(1)	IS	TOTAL
399	10	4	5	2	2	8	31
400	24	1	4	0	2	0	31
402	0	0	4	1	0	11	15
420	0	11	5	1	0	7	24
421	0	4	1	0	0	1	6
TOTAL	34	20	18	4	4	27	107

SUP= Special Use Permit Sites; NA= Native Allotment; SS=Suspected Sites; HS=Historic Sites Listed on the Alaska Heritage Resource Survey; 14(h)(1)=Historic and Cemetery Sites Selected by Sealaska Corporation under 14(h)(1) of the Alaska Native Claims Settlement Act; IS= Indigenous Sites Listed on the Alaska Heritage Resource Survey.

Indigenous sites include villages, middens, temporary camps, fish weirs, fish traps, cemeteries, forts or defensive sites, culturally modified trees, petroglyphs, pictographs and garden sites. Historic period sites include cabins, camps, fur farms, canneries and salteries. Native allotments include those parcels of land applied for by Native Alaskans. Special use permits include those areas that were granted Forest Service permits prior to 1942, but have not been verified on the ground as historic sites. Suspected sites are those that are reported in the literature or have been observed by non-professionals, but which have not been field verified.

Prior to the field survey conducted for this study, a total of 26 heritage resource surveys had been conducted in the project area at various levels of intensity (see Table 3-21). These range from reconnaissance surveys (n=14), where areas of expected sites are examined, to complete surveys (n=12) which are designed to identify all heritage resources within a given area. The vast majority of these surveys have been conducted by archaeologists examining various Forest Service projects. Forest Service archaeologists surveyed almost 33 miles of coastline and about 1,250 acres within the project area prior to the current study.

**Table 3-26** Cultural Resource Surveys in the Kuiu Island Project Area

VCU	Miles of Surveyed Coastline	Acres Surveyed	Survey Type	By Whom	Date
399	2.41	N/A	Reconnaissance	Reger	1974
		20.0	Reconnaissance	Roberts	1985
		11.5	Reconnaissance	Roberts	1988
TOTAL		31.5	3 Reconnaissance Surveys		
400	0	90.0	Complete	McCallum	1990
TOTAL		90.0	1 Complete Survey		
402	6.98	N/A	Reconnaissance	Reger	1974
		24.0	Reconnaissance	Arndt	1979
		60.0	Reconnaissance	Roberts	1988
		7.3	Complete	McCallum	1989
		155.0	Complete	McCallum	1990
TOTAL		336.3	3 Reconnaissance, 2 Complete Surveys		
420	23.0	N/A	Reconnaissance	Reger	1974
		6.0	Reconnaissance	Plaskett	1977
		82.0	Reconnaissance	Arndt	1979
		16.0	Reconnaissance	Arndt	1979
		12.0	Reconnaissance	Arndt	1979
		284.0	Reconnaissance	Arndt	1979
		0.5	Reconnaissance	Roberts	1985
		53.0	Complete	Roberts	1988
		60.0	Complete	McCallum	1989
		72.0	Complete	McCallum	1991
		18.0	Complete	Kauneckis	1991
		27.0	Complete	Kauneckis	1991
		3.0	Complete	Kauneckis	1992
		7.0	Complete	Kauneckis	1992
TOTAL		640.5	7 Reconnaissance, 7 Complete Surveys		
421	0.37	N/A	Reconnaissance	Reger	1974
		39	Complete	Hardin	1991
		116.0	Complete	Kauneckis	1992
TOTAL		155.0	1 Reconnaissance, 2 Complete Surveys		
TOTALS	32.76	1,253.3	14 Reconnaissance 12 Complete Surveys		

### Environmental Effects

Sealaska Corporation contracted for an archaeological and historical inventory of the region to identify historic and cemetery sites for selection under 14 (h)(1) of the Alaska Native Claims Settlement Act (Sealaska Corporation 1975). Sealaska selected several sites on Kuiu Island, including four that have been interim conveyed or conveyed to Sealaska Corporation within the project area. None of these sites will be affected by the proposed timber sale.

Heritage resources within the project area may contain significant information on past environmental conditions and human life-ways, possibly including information related to past conditions along the north Pacific Rim. These resources are both fragile and non-renewable. Primary impacts can include alteration to the settings of sites; alteration of above ground objects, features and structures; as well as the spatial relationships among them; and disturbance or destruction of subsurface heritage deposits. Secondary impacts may include a higher frequency of site vandalism due to increased access from constructed roads.

Federal laws and regulations (including the National Historic Preservation Act of 1966, as amended; the Archaeological Resources Protection Act of 1979, as amended; and the American Indian Religious Freedom Act of 1978) establish a process for considering the impacts of Federal projects on heritage resources. Section 106 of the National Historic Preservation Act requires us to identify heritage resources within proposed project areas, determine which are significant or eligible to the National Register of Historic Places, evaluate effects to significant sites, and design and implement measures to negate any adverse effects. We undertake this process in consultation with the Alaska State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation, where adverse effects are possible.

Forest Service archaeologists designed a theoretical model that assesses the probability of heritage resources across the project area. The model considers elevation and other variables for establishing a high probability for discovery of heritage resources. Factors we used to define the probability zones are general guidelines. It is apparent that people who have inhabited the area focused their activities on the coastline and marine environment. Scientists have confirmed that sea levels in the islands of southeast Alaska fluctuated throughout time. Therefore, it appears as though past sea levels play an indicator role in locating most heritage resources and the key criterion for establishing probability zones is elevation above the present coastline.

We define the high probability zone as all areas between mean high tide and 100 feet in elevation. In addition to this, the high probability zone includes a zone around all streams and lakes that have historically contained anadromous fish; mineralized zones exhibiting historic mining activities; geologic features such as karst areas, littoral caves and areas of volcanic sediments likely to contain bluff shelters; areas of traditional ethnohistoric subsistence use; and aboriginal myth and legend sites. The low probability zone includes all areas outside the high probability zone.

We applied this probability model to each alternative to gauge the potential effect to heritage resources. Generally, those alternatives that favor more development pose a greater threat to undiscovered heritage resources. Implementation of a 1,000-foot beach fringe and estuary buffer zone for all alternatives effectively eliminates the areas of highest potential for heritage resources. An examination of ground disturbing activities in relation to the heritage resource probability model indicates that none of the alternatives threaten the preservation of heritage resources eligible to the National Register of Historic Places. The "no action" alternative by its very nature constitutes the least threat to heritage resources.

In 1992 Stikine Area archaeologists surveyed four timber harvest units within the project area. They discovered 249 culturally modified trees, but no other heritage resources were discovered in the surveyed areas. The recorded culturally modified trees are widely scattered and are not eligible for the National Register of Historic Places. The vast majority of recorded culturally modified trees are triangular bark-stripped Alaska-cedar found on ridges and other well-drained areas. The fact that they are scattered and lack associated sites or artifacts indicate they are not significant. Table 3-22 presents a summary of surveyed areas and results. In addition to the survey of timber harvest units, archaeologists also examined other areas within VCUs 399, 400 and 402 to confirm the assumptions of the heritage resource probability model. Archaeologists surveyed about 290 acres outside of proposed direct impact areas, including a portion in the low probability zone.

**Table 3-27 Cultural Resource Survey Areas and Results**

VCU	Unit Number	Acres	Heritage Resources Present
400	400-8	29	None
402	402-28	7	109 CMTs
	402-29	23	140 CMTs
	402-30	10	None
TOTAL		69	249 CMTs

CMTs = Culturally modified tree

Previous surveys combined with our current study present a reliable understanding of heritage resource distribution across the project area. Combined, archaeologists have surveyed over 1,600 acres within the project area, including about 33 miles of coastline. The known and reported heritage resource sites in the project area are surrounded by protective buffers and will not be affected. Implementation of a 1,000-foot beach fringe and estuary buffer zone effectively minimizes the probability of impacting heritage resources eligible for inclusion in the National Register of Historic Places.

The Stikine Area submitted a report to the Alaska State Historic Preservation Officer presenting the heritage resource probability model, an extensive literature and files search and the results of the field survey. We determined that there are no historic properties (sites eligible to the National Register of Historic Places) within the area of potential effect for this project. We propose to conduct post-construction monitoring of all areas of ground exposure along the proposed road system, regardless of placement within the heritage resource probability model. This form of monitoring will serve to validate the assumptions of the heritage resource probability model as to the spatial distribution of heritage resources and to determine the effectiveness of site discovery techniques used during the field survey. The Alaska State Historic Preservation Officer agreed with our determination that there are no sites eligible to the National Register of Historic Places within areas of potential effect.

**Cumulative Effects**

Impacts from decay, natural landscape changes and development pose a threat to the preservation of significant heritage resources in the project area. Future timber harvest combined with other ground disturbing activities could result in a loss of heritage resources. Increased access to heritage resource sites also poses a potential threat from vandalism and looting. Known heritage resource sites will be periodically monitored to determine if any natural or human-caused impacts are occurring. Previous heritage resource inventories indicate most if not all of the heritage resources are located within a short distance of the

present coastline. It is impossible; however, to determine the exact number and nature of heritage resources that are threatened by future development. Maintenance of beach fringe and estuary protective buffer zones for future development will effectively lessen the potential impact to heritage resources. Implementation of field inventories and various mitigation measures will reduce the potential loss by preserving significant sites and by providing data on those that cannot be preserved.

No heritage resources eligible to the National Register of Historic Places have been identified during previous heritage resource surveys of timber harvest units and associated development. Validation monitoring has confirmed assumptions about the heritage resource sites. No project area sites, other than scattered culturally modified trees, have been located at elevations above 50 feet.

**Ecological  
Characteristics-  
Commercial  
Species****Timber Resource**

Four commercial tree species are present in the analysis area. They are western hemlock, mountain hemlock, Alaska cedar, and Sitka spruce. Each of these species possesses certain characteristics that will determine its location and abundance on the landscape. Each species forms plant communities or plant associations with other trees, shrubs, and forbs. The species composition of a plant association reflects the soil, climate, and disturbance history of a site.

**Western Hemlock**

Western Hemlock is the most abundant tree on the forest. Very shade tolerant, it dominates the reproduction under dense forest canopies. With time it replaces less shade tolerant species on most sites. Seed is produced in most years, with heavy crops every few years. The seed is small and can be carried long distances in strong wind. Since its seeds germinate easily, and since viability is high, natural reproduction can be obtained through various reproduction methods from single tree selection to clearcutting. A shallow root system makes it susceptible to wind throw, and its thin bark makes it susceptible to logging injury. Principal insect pests include the brown-headed budworm and the hemlock sawfly. Most tree mortality occurs when populations of both insects are high. Most mortality to mature hemlock is from root and stem rotting fungi. Trees may be killed outright, or more commonly, from breakage of decayed stems during windstorms. Dwarf mistletoe is a destructive parasite that reduces tree vigor, reduces wood quality and makes trees more susceptible to infection by decay fungi. Seeds that are ejected under force from overstory trees to the understory spread it. Common western hemlock plant associations include Western hemlock/Blueberry, Western hemlock/Blueberry/Shield fern, and Western hemlock/Blueberry/Skunk cabbage.

**Mountain Hemlock**

Mountain hemlock is a minor commercial species on the forest. Mostly restricted to subalpine communities, it is present at lower elevations on poorer sites where its presence is generally an indication of Mixed-Conifer plant associations. It is very shade tolerant but is slow growing and competes poorly with other tree species on good sites. Seed production is moderate, even in the best seed years. Since mountain hemlock has not been extensively harvested in southeast Alaska, it is not known whether regeneration problems exist. A shallow root system makes it susceptible to wind throw, and its thin bark makes it susceptible to logging injury. Principal insect pests include the brown-headed budworm and the hemlock sawfly. Most tree mortality occurs when populations of both insects are high. Most mortality to mature hemlock is from root and stem rotting fungi. Trees may be killed outright or from breakage of decayed stems during windstorms. Mountain hemlock is rarely infected by dwarf mistletoe. In the subalpine, Mountain hemlock/Blueberry and Mountain hemlock/Blueberry/Marsh marigold are the most common plant associations. At lower elevations, mountain hemlock is commonly found in Mixed-conifer/Blueberry and Mixed-conifer/Blueberry/Skunk cabbage plant associations where it occurs along with Alaska cedar, western hemlock and Sitka spruce.

**Alaska-Cedar**

Alaska cedar is a minor, but valuable, commercial tree found within the project area. At lower elevations it is commonly found on poorly drained organic soils. Best growth is at mid elevations where it grows with western hemlock. Alaska cedar is moderately shade tolerant and produces irregular cone crops. Its seeds are heavy with small wings and are not carried far by wind. Seeds have delayed germination and seedling growth is usually slow. The wood is highly resistant to decay. Alaska-cedar decline is the most important disease. Its cause is not known. Common plant associations are Western hemlock-Alaska-cedar/Blueberry and Western hemlock-Alaska-cedar/Blueberry/Skunk Cabbage.

### Silvicultural Systems

#### Sitka Spruce

Sitka spruce is the largest and one of the most valuable commercial trees. It is found on a variety of sites from sea level to the subalpine. It is intermediate in shade tolerance but is a prolific seed producer. Consequently, some seedlings are usually present in forest understories. Its seeds are small and can be carried for great distances by the wind. Seed germination is high and natural regeneration can be obtained through various means. Sitka spruce is shallow rooted and vulnerable to compaction and blowdown. The bark is relatively thin and susceptible to logging injury. Spruce beetle is the most serious insect pest. Most outbreaks originate in blowdown or logging debris and spread to adjacent standing timber. The heartwood of Sitka spruce is somewhat resistant to decay. However, root and stem decay account for most mortality of mature trees by directly killing the trees or making them susceptible to breakage from wind. Sitka spruce plant associations are found primarily at low elevations on well-drained alluvial fans, riparian areas, or avalanche chutes. Common associations include Sitka spruce/Devil's club, Sitka spruce/Blueberry-Devil's club, and Sitka spruce/Blueberry-Devil's club/Skunk cabbage.

Silvicultural systems are used to tend, harvest, and re-establish forest stands. Treatments are applied throughout the life of the stand for the purpose of reaching a desired future condition. Treatments include the harvest or regeneration of the stand, intermediate cuttings, and other cultural treatments necessary for the replacement and development of the forest stand. No single silvicultural system can produce all desired combinations of products and amenities from a particular stand or project area. A prescription is a written record that includes treatments prescribed for the stand. Prescriptions are prepared and written by a certified silviculturist.

Silvicultural systems can be even-aged, two-aged, or uneven-aged. Even-aged systems produce stands that have trees of the same or nearly the same age. Uneven-aged systems create stands that have three or more age classes.

All of the areas proposed for timber harvest will be restocked within 5 years as required under the National Forest Management Act of 1976 (NFMA). Harvested sites must contain a minimum of 300 well-dispersed trees per acre by the fifth year following harvest to be considered successfully regenerated. Regeneration (stocking) surveys will be conducted on all harvest units the third full growing season after yarding is completed. This survey is used to determine whether additional reforestation efforts are required. Where necessary, a fifth year survey is used to certify that regeneration has been successful.

#### Precommercial Thinning

Regeneration on clearcuts may result in seedling numbers in excess of three to four thousand trees per acre. Although these stands will thin naturally, production of usable wood fiber can be hastened with less dense stocking. Growth and yield models using a 100-year rotation indicated that precommercial thinning increases timber production. Precommercial thinning reduces competition for sunlight and nutrients. Growth of understory plants and the remaining conifers is accelerated. Precommercial thinning can also be used to regulate species composition of crop trees.

Recent trends in forestry have moved toward stands with wider spaced trees. More light penetrates to the forest floor favoring shrub and forb development thereby increasing wildlife forage. As stands mature, they reach the stage where tree density begins to block light to the forest floor. Thinning before canopy closure would again promote understory growth, enhance forage production and increase tree diameter growth. However, wider spacings result in large branches that are retained longer.

Site quality affects the timing of precommercial thinning. On low quality sites, where tree growth is slow, precommercial thinning is planned 20-25 years or more after harvest. On highly productive sites, thinning is planned 15-20 years after harvest. Tree growth models show that thinning to 12 by 12-foot spacing increase volume production by nine percent over unthinned stands or stands thinned to 18 by 18-foot spacing.

It is not known whether precommercial thinning will have application in uneven-aged systems. It may have use where group selection is used. Likely, it will not be used where diameter limit cuts or other methods of individual tree selection are used.

### **Pruning**

Pruning can be used to improve wood quality and increase value by maximizing the amount of clear wood. Pruning wounds heal quickly when branches are small, and pruning allows more light to reach the forest floor. This stimulates the growth of understory vegetation for wildlife forage. To date, only a few second-growth stands have been pruned. Whether pruning will play an important role in the future in managed forests is not known. Much needs to be learned concerning its long-term benefits in relation to cost associated with pruning.

### **Commercial Thinning**

Currently, commercial thinning is rarely used in southeast Alaska. Most managed stands are not of sufficient size to produce commercial products. Thinning is rarely economical because of the limited demand for small diameter logs and the expenses associated with logging.

In southeast Alaska, silvicultural options have often been chosen to avoid the risk of windthrow or damage to residuals. In areas of high windthrow risk entry was deferred or the stands were clearcut. Other forms of regeneration harvest were generally not considered. Areas with moderate or low windthrow risk were thought to have a wider range of options and some uneven-aged regeneration cuts were made. Uneven-aged systems have also been used in a few areas where there were visual or wildlife habitat concerns.

## **Selection of Harvest Method**

Economics has also been an important factor in choosing the harvest method. In most situations, clearcutting with cable yarding is more cost efficient than other methods. Although cable yarding is not possible with most uneven-aged systems, it can be used where logs are first yarded laterally a short distance and then yarded up hill through corridors. Where down hill yarding is required, cable yarding does not work well for uneven-aged management, but it can be used on clearcuts. Shovel and helicopter yarding lend themselves to both even-aged and uneven-aged systems. Shovel yarding is often economical but cannot be used on steep slopes. Helicopter yarding is usually the most expensive yarding method, but some costs can be offset if less road construction is needed.

Two basically different types of harvest will be used in the Crane and Rowan timber sales. Clear-cut harvest (with reserves) will produce an even age stand. The diameter limit harvest is designed to produce a managed stand with two or more age classes. These two types of managed stands together with unharvested areas will be used to create a managed forest that maintains natural disturbance processes and ecological functions and closely resembles natural patterns on the landscape.

### **Clear-cut Harvest (with wildlife legacy trees retained)**

This harvest method removes the entire stand in one cutting with the exception of some reserve trees. The objective of this method is to create a fast growing even age stand to maximize wood fiber production. Some trees, about 10 to 15 percent canopy cover, will be retained as a biological legacy to maintain some structural and biological diversity in the new stand. These reserve trees will generally be large defective old trees with little commercial value, and they will not be managed for fiber production in the new stand. Reserve trees will

be unevenly distributed, their location depending largely on the capability of the downhill cable yarding systems.

These sites are expected to regenerate naturally, as have all other previously harvested areas in the project area. This stand reinitiation stage is expected to last for 10 to 15 years. The new second growth stand will remain in the stem exclusion stage throughout most of its rotation age, which is expected to be about 90 to 120 years on most sites. Tree density and species composition can be adjusted by precommercial thinning to maintain a fast growing productive stand. Thinning can also minimize the length of time the stand is in the stem exclusion stage by delaying canopy closure. Reserve trees will remain throughout the rotation, however some mortality is expected due to blowdown or other causes.

### **Diameter Limit Harvest**

The diameter limit harvest is designed to harvest most of the economically valuable trees while leaving most of the trees that are valuable as wildlife habitat. A large portion of the net volume would be harvested while all of the small diameter trees and many of the very large trees would be retained. It will produce a managed stand with two or more age classes and sizes of trees.

On the average, this harvest is designed to leave about half of the original canopy cover. Application of the same diameter limit prescription will have different end results depending on the volume strata and the diameter distribution of trees in the original stand. (Figures 2-7, 2-8, and 2-9). Diameter limit harvest units that are yarded with a helicopter will also have a somewhat different appearance than units yarded with uphill cable systems.

Based on preliminary field measurements, the diameter limit method would harvest, all western hemlock between 16 and 38 inches in diameter, all Alaska-cedar greater than 24 inches, and all Sitka spruce greater than 16 inches except for one large decadent Sitka spruce every 10 acres that will be individually marked as leave trees. Trees retained would be: all western hemlock and Sitka spruce less and 16 inches; all Alaska-cedar less than 24 inches; all western hemlock greater than 38 inches, and one large decadent Sitka spruce per 10 acres.

The managed second growth stand will, over time, develop multiple age classes and multiple size classes of trees. The stand will consist of the newly regenerated trees; the small diameter leave trees, some of which will release to become crop trees, and the large mostly defective hemlock and spruce reserve trees. On sites exposed to strong windstorms, many of the large old trees will likely blow over resulting in a two age stand that closely resembles the naturally occurring stands that develop after partial blowdown. On protected sites, where the large old trees will persist, these stands are expected to trend toward an uneven-age condition.

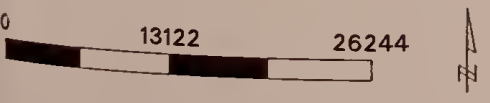
Second growth management of these stands will emphasize production of high quality timber while maintaining ecological functions and stand structural characteristics important for wildlife habitat. Post-harvest treatments, if needed to meet this objective, will be based on the specific stand characteristics identified during stand exams. Precommercial thinning can alter the tree density and species composition of any size class. Thinning may not be needed on some of these stands since regeneration may not be as dense as is typically the case after clearcut harvest. Recent investigations in partially harvested stands in Southeast Alaska indicate that these stands will not likely go through the stem exclusion stage as do even age stands. Instead, the appearance and structural characteristics are expected to closely resemble of the understory reinitiation stage throughout most of the rotation.

Figure 3-4  
Harvest Areas by  
Volume Strata

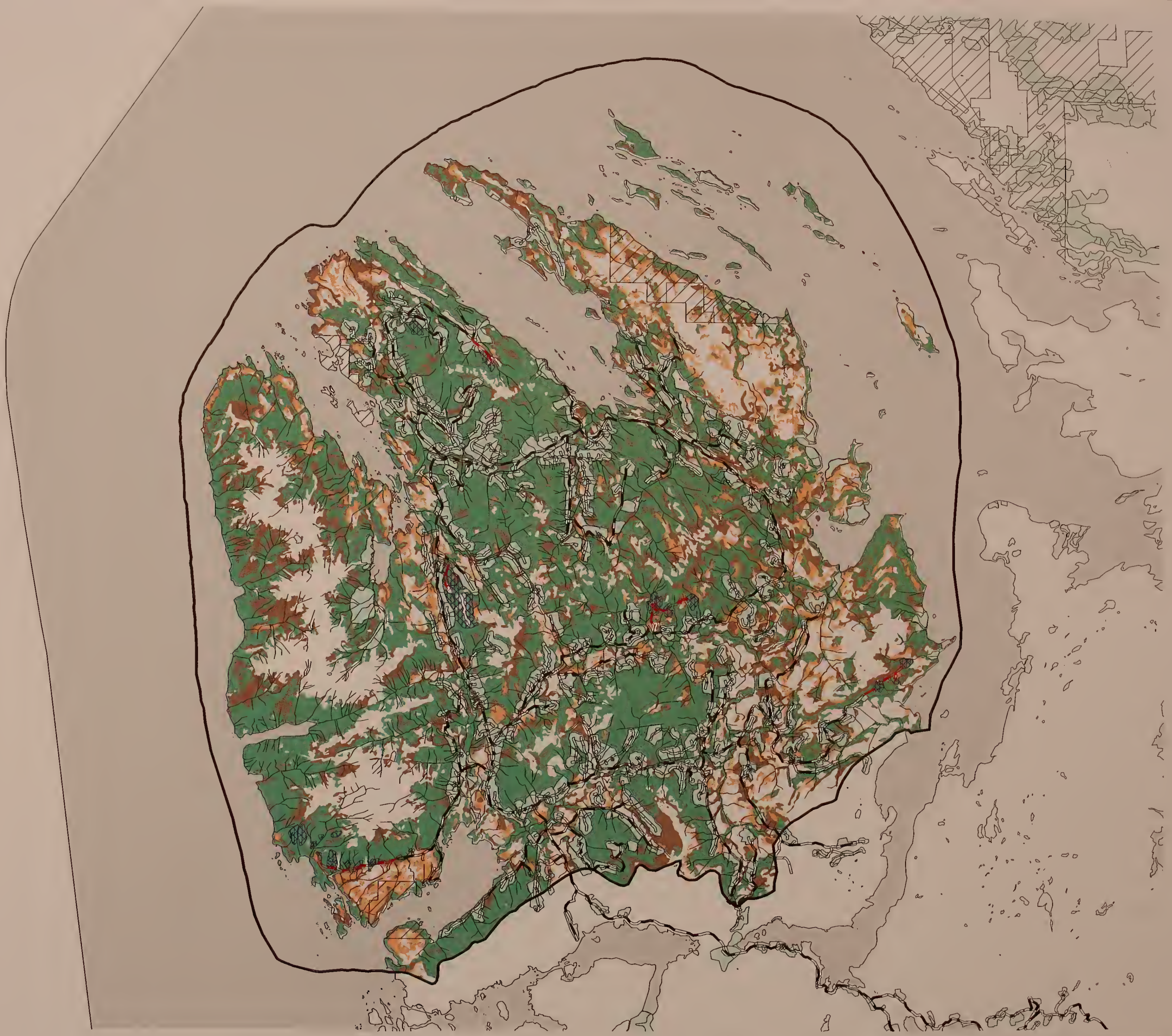
- Legend
- Low Volume Strata
  - Medium Volume Strata
  - High Volume Strata
  - Existing Managed Stands
  - Saltwater
  - Proposed Harvest Units, All Alternatives
  - Non-National Forest Lands
  - Project Area Boundary
  - Existing Open Roads
  - Existing Closed Roads
  - Proposed Roads
  - Shoreline, Lakes, Streams



STIKINE AREA VICINITY MAP  
MAP AREA SHOWN IN ORANGE



\\gis\projects\crane\_rowan\plots\docmaps\volstrata.map  
feismap.aml and volstrata.aml 07/21/98





**Table 3-28** Acres of Proposed Harvest by Clearcut (cc) and Diameter Limit Cut (dl)

	Low		Medium		High		Subtotal		Total
	Volume		Volume		Volume				
	cc	dl	cc	dl	cc	dl	cc	dl	All
Alt. 2	12	0	117	0	609	0	738	0	738
Alt. 3	0	12	33	83	148	462	181	557	738
Alt. 4	0	16	22	135	138	746	159	897	1056
Alt. 5	7	0	78	3	463	161	548	164	712

Alternative 1 proposes no timber harvest at this time and therefore does not provide an opportunity to bring forest sites under management. Alternatives 2 and 3 would both bring 738 acres under management. In Alternative 2 all acres would be managed as even-aged stands. For Alternative 3, 181 acres would be managed under even-aged systems while 557 acres would be managed under uneven-aged systems. The greatest number of acres brought under management would occur with Alternative 4. This alternative brings 151 acres under even-aged systems and 888 acres under even-aged systems. The fewest acres would be harvested in Alternative 5. This alternative brings 528 acres under even-aged management and 167 acres under uneven-aged management.

## Threatened, Endangered, and Sensitive Plants

No Threatened or Endangered plants are known to occur on the Tongass National Forest. Twenty-two plant species are designated as Sensitive for the Alaska Region. In addition, ascending moonwort fern (*Botrychium ascendens*), super round wedge moonwort fern (*Botrychium* spp.--yet unnamed), and a variety of netleaf willow (*Salix reticulata* spp. *glabellcarpa*) were identified as proposed Sensitive Plants in the Forest Plan. Fifteen of these species are known to occur or are suspected of occurring on the Petersburg Ranger District.

The known sensitive plants on the Petersburg Ranger District include Wright filmy fern (*Hymenophyllum wrightii*), Choris bog orchid (*Platanthera chorisiana*), Davy mannagrass (*Glyceria leptostachya*), and loose-flowered bluegrass (*Poa laxiflora*). Wright filmy fern is known from two locations on Mitkof Island where it was found on moist shaded rock ledges. Choris bog orchid has been found in muskegs and forested wetlands at several locations on Kupreanof and Mitkof Islands, and at several locations on the East Side of Kuiu Island from Reed Bay to No Name Bay. It is also present on the mainland near Cape Fanshaw. Davy mannagrass has been found on Mitkof Island at several locations and is common on disturbed wet sites in and around Petersburg. Loose-flowered bluegrass has been found at one location on north Kupreanof Island and at one location on Kuiu Island near No Name Bay. On Kuiu Island it was growing near the high tide line on rock ledges and on Kupreanof Island it was found along a stream channel.

# **Chapter 4**

## **List of Preparers**

THE UNIVERSITY OF CHICAGO

CHICAGO, ILLINOIS

1911

# Chapter 4

## List of Preparers

**Rob Aiken**, Civil Engineer/Transportation Planner

B.S. Forest Engineering, Oregon State University

Forest Service: 19 years.

Civil Engineer, Stikine Area, Tongass N.F., 13 years;

Forester, Alsea Ranger District, Siuslaw N.F., 4 years;

Cooperative Education Student, 2 years.

**Steve Alarid**, GIS Analyst

B.S. Forest Management, Oregon State University

M.F. Forest Engineering, Oregon State University

Forest Service: 13 years.

GIS Analyst, Stikine Area, Tongass N.F., 4 years;

Forester, Siuslaw N.F., 5 years.

**James Brainard**, Wildlife Biologist

B.S. Forest Management, Washington State University, 1983.

Forest Service: 11 years.

Wildlife Biologist, Stikine Area, Tongass N.F., 6 years;

Forester, Ketchikan Area, Tongass N.F., 2 years;

Forestry Technician, Spotted Owl Monitoring, Mendocino and Wenatchee National Forests, 2 years;

Forestry Technician, Silviculture, Wenatchee N.F., 1 year.

Other Employment:

Agricultural Research Technologist, Vertebrate Pest Management, Washington State University, 4 years.

## 4 List of Preparers

### **Jim Cariello, Habitat Biologist**

B.S. Wildlife and Fisheries Resources, University of Idaho.

Fisheries Biologist, Stikine Area, Tongass N.F., 5 years, on contract from the Alaska Department of Fish and Game.

#### Other Employment:

Habitat Biologist, Alaska Department of Fish and Game, 5 years;

Fisheries Biologist, Alaska Department of Fish and Game, 9 years;

Fisheries Biologist, U.S. Fish and Wildlife Service, 1 year.

### **Mary Clemens, Recreation Forester**

B.S. Forestry, Washington State University.

Forest Service: 16 years.

Recreation Forester, Stikine Area, Tongass N.F., 8 years;

Forestry Technician/Forester, Stikine Area, Tongass N.F., 8 years.

### **Bob Gerdes, Interdisciplinary Team Leader and Forester, Retired**

B.S. Forestry, Iowa State University.

Forest Service, Stikine Area, Tongass N.F., 34 years;

Experience in logging systems design and planning, unit layout, timber planning, and all aspects of forestry.

### **Gail Johnejack, Writer/Editor**

B.S. Wildland Watershed Management, Utah State University.

Forest Service: 13 years.

Writer/Editor, Stikine Area, Tongass N.F., 1 year;

Hydrologist, Stikine Area, Tongass N.F., 9 years;

Hydrology Technician/Hydrologist, Lake Tahoe Basin Management Unit, 3 years.

### **Everett Kissinger, Soils Scientist**

B.S. Soil Science, University of Wisconsin, Madison.

Forest Service: 20 years.

Forest Soils Scientist, Stikine Area, Tongass N.F.;

Watershed Staff Officer, Stikine Area, Tongass N.F.;

Soil Scientist with USDA Soil Conservation Service, 10 years.

**Mark McCallum, Archaeologist**

B.A. Anthropology, James Madison University.

Forest Service: 9 years.

Forest Archaeologist, Stikine Area, Tongass N.F.

Other Employment:

Private Consultant, 10 years.

**Bill Pawuk, Ecologist**

B.S. Forestry, Penn State University.

M.S. Plant Pathology, Penn State University.

Ph.D. Plant Pathology, University of New Hampshire.

Forest Service, 26 years.

Ecologist, Stikine Area, Tongass N.F., 9 years;

Nursery Manager, Stikine Area, Tongass N.F., 8 years;

Research Plant Pathologist, Southern Forest Experimental Station, 5 years;

Plant Pathologist, Forest Insect and Disease Survey, 5 years.

**Bruce Sims, Hydrologist**

M.S. Watershed Management, University of Arizona.

Forest Service: 19 years

District/Forest Hydrologist, Stikine Area, Tongass N.F., 2 years;

Forest Hydrologist, Santa Fe N.F., 9.5 years,

Hydrologist, Siskiyou N.F., 7.5 years.

**Jim Steward, Landscape Architect**

Oregon State University.

Forest Service: 14 years.

Landscape Architect, Stikine Area, Tongass N.F., 5 years,

Landscape Architect, Klamath N.F., 4 years,

Forestry Technician, Umatilla N.F., 5 years.

**Lorraine Thomas, Writer/Editor**

B.S. Forestry, Southern Illinois University

Forest Service: 16 years.

Lands, Minerals, Wilderness Specialist, Chatham Area, Tongass N.F., 1 year;

Recreation Forester, Chatham Area, Tongass N. F., 10 years;

Forester, Shawnee N. F., 4 years.

# 4 List of Preparers

# **Chapter 5**

## **List of Document Recipients**

## Chapter 2

Let's go to the  
next page

# Chapter 5

## Listing of Document Recipients

**List of Agencies, Organizations, and Individuals on the Mailing List for the Crane and Rowan Mountain DEIS.**

Adams Alaskan Safaris  
Alaska Charter Service  
Alaska Coastal Outfitters  
Alaska Island Adventures  
Alaska Department of Environmental Conservation –Air and Water Quality  
Alaska Department of Fish and Game  
Alaska Department of Natural Resources  
Alaska Division of Governmental Coordination  
Alaska Forest Association  
Alaska Outdoor Adventures  
Alaska Passages  
Alaska Pulp Corporation (George Woodbury)  
Alaska State Library  
Alaska Tug Boat Tours  
Alaskan Solitude  
Alaskan Yacht Charters  
Alpine Guide Service  
Dave Beebe  
Steve Blatt  
Blue Water Adventures  
Jim Boyce  
Peter Branson

# 5 List of Document Recipients

Bob and Julie Byers  
Chat and Jo Chatham  
Emil Churchill  
City of Kupreanof  
Coastal Island Charters  
Coastal Wilderness Charters  
Randy Coleman  
Steve Connelly  
Earthjustice Legal Defense  
Larry Edwards  
Ellis Inc.  
Family Charters  
Gene Feind  
Tim Fenner  
Forbes Marine Charters  
Forest Service Employees for Environmental Ethics  
Foster Wheeler Environ Corp  
Barney Freedman  
H. Paul Friesema  
Michael Galginaites  
Gayle Wind Charters  
John Geddie  
Glacier Energy Ltd.  
Glacier Guides, Inc.  
Charles Gregory  
Hallco Corp.  
Kenneth J. Hammons  
Joel and Alice Hanson  
Lloyd Hartshorn  
Kim Hastings  
T.C. Hicks  
Guy Hopper

## List of Document Recipients **5**

Eleanor Huffines  
Jeff Hupp  
Inside Passage  
Peterson Guide and Charter Service  
Merrily Jones  
Karen Johnson  
Kake Tribal Logging Corp.  
David Kensinger  
Ketchikan Pulp Company  
Mark Kirchhoff  
Erik Lie-Nielsen  
Mim McConnell  
Beverly McLaughlin  
Brock Meredith  
Narrows Conservation Coalition  
Ocean Ranger Charters  
Outdoor Adventures  
Organized Village of Kake  
Bruce Parker  
Petersburg Pilot  
David Randrup  
Matt Rasmussen  
Raven Guide and Charters  
R.Q.D. Reeves  
Rocky Pass Resort  
Robertson, Monagle & Eastaugh  
Dane Roundtree  
Don Sautner  
Seley Corporation  
Seminars Afloat  
Silver Bay Logging Company  
Ronald Simpson

# 5

## List of Document Recipients

SE AK Conservation Council  
Southeast AK Forest Dwellers  
Southeast Hunts  
Special Expeditions  
Southeast Exposure  
David Spigai  
Richard and Sharon Sprague  
Pat Taggart  
The Tongass Conservancy  
Tongass Kayak Adventures  
US Army Corp of Engineers  
US Department of Commerce, NOAA  
US Environmental Protection Agency – Alaska Operations  
USDI, Fish and Wildlife Service  
USDA Forest Service, S&PF  
USFS Tongass National Forest, Petersburg  
Vanguard Research  
Winifred O. Weber  
Marc Wheeler  
Wrangell Resource Council

# **Chapter 6**

## **Glossary**

# Chapter 4

## Chapter 4

# Chapter 6

## Glossary

### Acronyms Used in this Text

<b>ACMP</b>	-----	Alaska Coastal Management Program
<b>ADF&amp;G</b>	-----	Alaska Department of Fish and Game
<b>AHMU</b>	-----	Aquatic Habitat Management Unit
<b>ANSCA</b>	-----	Alaska Native Settlement Act of 1971
<b>ANILCA</b>	-----	Alaska National Interest Lands Conservation Act of 1980
<b>APC</b>	-----	Alaska Pulp Corporation
<b>ASQ</b>	-----	Allowable Sale Quantity
<b>BLM</b>	-----	Bureau of Land Management
<b>BMP</b>	-----	Best Management Practices
<b>CFL</b>	-----	Commercial Forest Land
<b>CFR</b>	-----	Code of Federal Regulations
<b>CMP</b>	-----	Corrugated Metal Pipe
<b>CMPA</b>	-----	Corrugated Metal Pipe Arch
<b>CZMA</b>	-----	Coastal Zone Management Act of 1976
<b>DEIS</b>	-----	Draft Environmental Impact Statement
<b>EIS</b>	-----	Environmental Impact Statement
<b>EPA</b>	-----	Environmental Protection Agency
<b>FEIS</b>	-----	Final Environmental Impact Statement
<b>FPA</b>	-----	Forest Practices Act
<b>FSH</b>	-----	Forest Service Handbook
<b>FSM</b>	-----	Forest Service Manual
<b>GIS</b>	-----	Geographic Information System

# 6 Glossary

GMU	Game Management Unit
IDT	Interdisciplinary Team
KV	Knutsen-Vandenberg Act
LTF	Log Transfer Facility
LUD	Land Use Designation
LWD	Large Woody Debris
MBF	One Thousand Board Feet
MIS	Management Indicator Species
MMBF	One Million Board Feet
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act of 1969
NFMA	National Forest Management Act
NOI	Notice of Intent
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
RVD	Recreation Visitor Day
SEIS	Supplemental Environmental Impact Statement
SHPO	State Historic Preservation Officer
TLMP	Tongass Land Management Plan
TRUCS	Tongass Resource Use Cooperative Survey
TTRA	Tongass Timber Reform Act
USDA	United States Department of Agriculture
VCU	Value Comparison Unit
VQO	Visual Quality Objective
WAA	Wildlife Analysis Area

## Adopted Visual Quality Objectives

A desired level of scenic quality and diversity of natural features based on physical and sociological characteristics of an area. Refers to the degree of acceptable alterations of the characteristic landscape. The Adopted VQO is given by management direction identified in the Forest Plan.

## Alaska National Interest Lands Conservation Act (ANILCA)

Passed by Congress in 1980, this legislation designated 14 national forest wilderness areas in southeast Alaska. In section 705(a) Congress directed that at least \$40,000,000 be made available annually to the Tongass Timber Supply Fund to maintain the timber supply from the Tongass National Forest at a rate of 4.5 billion board feet per decade. Section 810 requires evaluation of subsistence impacts before changing the use of these lands.

**Alaska Native Claims Settlement Act (ANSCA)**

ANSCA, which became law on December 18, 1971, provides for the settlement of certain land claims of Alaska natives and for other purposes.

**Alaska Pulp Corporation (APC)**

Previously Alaska Lumber and Pulp Corporation

**Alevin**

Larval salmonid that has hatched but has not fully absorbed its yolk sac, and generally has not yet emerged from the spawning gravel.

**Allowable Sale Quantity (ASQ)**

ASQ refers to the maximum quantity of timber that may be sold each decade from the Tongass National Forest. This quantity, expressed as a board foot measure, is calculated based on the timber utilization standards specified in the Alaska Regional Guide, the number and type of acres available for timber management, and the intensity of timber management.

**Alpine/Subalpine Habitat**

The habitat found on mountain peaks above 1500 feet in elevation.

**Anadromous Fish**

Fish which mature and spend much of their adult life in the ocean, returning to inland waters to spawn. Salmon and steelhead are examples.

**Arterial Road**

A forest road that provides service to large land areas and usually connects with other arterial roads or public highways.

**Beach Fringe Habitat**

Areas reserved for habitat that occurs from the intertidal zone inland a distance of 1000 feet. This habitat is important to both marine and upland species.

**Benthic Habitat**

Refers to the substrate and organisms on the bottom of marine environments.

**Best Management Practices (BMP)**

Land management methods, measures or practices intended to minimize or reduce water pollution. Usually BMPs are applied as a system of practices rather than a single practice. BMPs are selected on the basis of site-specific conditions that reflect natural background conditions and political, social, economic, and technical feasibility.

**Biodiversity**

Variety of life and its processes including the complexity of species, communities, gene pools, and ecological functions, within the area covered by a land management plan.

**Board Foot**

One board foot is equivalent to a plank one-foot square and one inch thick; it contains 144 cubic inches of wood.

**Cant**

A log that has been partly or wholly cut and is destined for further processing. Tongass National Forest Timber is sometimes cut into cants to prior to export to satisfy laws requiring at least partial processing of national forest timber prior to export.

**Carrying Capacity**

The population that a given area can support without undergoing habitat degradation.

**Clearcut Harvest Method**

A harvest method in which all or nearly all of the trees are removed in one cut. It prepares the area for a new even-aged stand. As used in the Crane and Rowan Mountain project area, clearcut harvest will retain approximately 10 percent of the canopy as reserve trees.

**Collector Road**

A forest road that serves smaller land areas than an arterial road. Usually connects forest arterial roads to forest local roads or terminal facilities.

**Commercial Fishery**

Fish, shellfish, or other fishery resources taken or processed within a designated area for commercial purposes.

**Commercial Forest Land**

Productive forestland that is producing, or capable of producing, crops of industrial wood and is not withdrawn from timber utilization by statute or administrative regulation. This includes areas suitable for management and generally capable of producing in excess of 20 cubic feet per acre of annual growth, or in excess of 8,000 board feet net volume per acre. It includes accessible and inaccessible areas.

*Standard CFL:* Timber that can be economically harvested with locally available logging systems such as highlead or short-span skyline.

*Nonstandard CFL:* Timber that cannot be harvested with locally available logging systems and would require the use of other logging systems such as helicopter or long-span skyline.

**Conveyance**

The passing of the title of a property from one owner to another.

**Cruise**

Refers to the general activity of determining timber volume and quality.

**Cultural Resources**

Historic or prehistoric objects, sites, buildings, structures, and so on, which result from past human activities.

**Culturally Modified Tree**

A culturally modified tree is a tree over 50 years old that has been intentionally altered by indigenous people participating in the traditional utilization of the forest.

**Cumulative Effects**

Cumulative effects are the impacts on the environment resulting from the addition of the incremental impacts of past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such action. Cumulative impacts can result from individually minor but collectively significant actions occurring over time.

**Deflection**

Logging systems engineers use this term to describe the deviation or the lowest point along the arc of a cable once the log load is attached to the cable. If for example a cable yarding system is used to yard logs over a stream channel, the system would be said to have adequate deflection to fully suspend over the stream channel.

**Deer Winter Range**

A combination of environmental elements that support Sitka black-tailed deer under moderately severe or severe winter conditions. Usually associated with high volume old growth stands at low elevation and south aspects.

**Direct Employment**

The jobs that are immediately associated with a given activity. In the case of this Long-Term Timber Sale, employment in the logging, sawmill, and pulpmill, would be examples of direct employment.

**Dispersed Recreation**

Recreational activities that are not confined to a specific place.

**Distance Zone**

Areas of landscapes denoted by specified distances from the observer (foreground, middleground, and background). Used as a frame of reference in which to discuss landscape characteristics of management activities.

**Draft Environmental Impact Statement (DEIS)**

A statement of environmental effects for a major Federal action released to the public and other agencies for comment and review prior to a final management decision. (Required by Section 102 of the national Environmental Policy Act.)

**Endemic**

Restricted to a particular locality. For example, a particular species or subspecies may occur on only one or a very few islands.

**Estuarine Fringe Habitat**

This habitat type is located within a 1,000-foot zone around an estuary. It is especially important for shorebirds, waterfowl, bald eagles, and other marine-associated species.

**Estuary**

For the purpose of this EIS, estuary refers to the relative flat, intertidal, and upland areas generally found at the heads of bays and mouths of streams. They are predominately mud and grass flats and are unforested except for scattered spruce or cottonwood.

**Even-Aged Management**

The applications of a combination of stand treatments that result in the creation of stands in which trees of essentially the same age grow together. The difference in age between trees forming the main canopy level of a stand usually does not exceed 20 percent. Clear-cut, shelterwood, or seed tree harvest methods produce even-age stands.

**Fish Habitat**

The aquatic environment and the immediately surrounding terrestrial environment that, combined, afford the necessary physical, biological support systems required by fish species during the various life stages.

**Fish Habitat Capability**

The carrying capacity or the maximum number of fish the habitat can produce. Habitat capability is measured in smolts for anadromous fish and in numbers of adult fish for resident species.

**Floodplain**

The lowland and relatively flat areas joining inland and coastal waters, including debris cones and flood-prone areas of offshore islands; including, at a minimum, that area subject to a 1 percent (100 year recurrence) or greater chance of flooding in any given year.

**Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA)**

Amended in 1976 by the National Forest Management Act.

## **Forest Development Road**

A forest road under the jurisdiction of the Forest Service.

## **Forest Development Transportation System**

Those facilities, forest development roads, trails, and air fields, in the transportation network and under Forest Service jurisdiction.

## **Forest Roads**

A road wholly or partly within, or adjacent to, and serving the National Forest System and is necessary for the protection, administration, and use of the National Forest System and the use and development of its resources.

## **Forested Habitat**

All areas with forest cover. Used in this EIS to represent a general habitat zone.

## **Grabinsiki**

A modified highlead cable logging system.

## **Group Selection Regeneration Method**

Small groups of trees are removed to create new groups of uniform, balanced age classes within the stand. The openings are usually regenerated from seed of the surrounding trees. Age class regulation within groups is usually accomplished by removing unwanted trees when adjacent groups are harvested.

## **Habitat Capability**

The number of healthy animals that a habitat can sustain.

## **Heritage Resources**

The prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places. The term includes artifacts, records, and remains that are related to and located within such properties.

## **High Hazard Soil**

A soil material prone to mass wasting. Soil type, geologic bedding, and slope angle are factors considered when establishing which sites are high hazard.

## **Highlead Cable Logging**

A method of transporting logs to a collecting point (landing) by using a power cable passing through a block fastened off the ground to lift the front ends of the logs off the ground while in transit.

## **Historic Property**

Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places. The term includes artifacts, records, and remains that are related to and located within such properties.

## **Important Subsistence Use Area**

Important Subsistence Use Areas include the "most-reliable" and "most often hunted" categories from the TRUCS survey and from subsistence survey data from ADF&G, the University of Alaska, and the Forest Service, Region 10. Important use areas include both intensive and extensive use areas for subsistence harvest of deer, furbearers, and salmon.

## **Indirect Employment**

The jobs in service industries that are associated with or support a given activity. In the case of the long-term Timber Sale, indirect employment would include jobs with suppliers of logging and milling equipment.

**Individual Tree Selection Harvest Method**

Single trees are removed throughout the stand, and new trees are established soon after each harvest occurs. Regeneration is normally from seed of the surrounding trees. Age class distribution in a stand is regulated by frequent harvests that remove trees from all age classes during each entry.

**Induced Employment**

The jobs in the service or governmental sectors that result from increased population or purchases associated with given activity, such as the Long-term Sale Contract.

**Inoperable Timber**

Timber that cannot be harvested by any proven method because of potential resource damage, extremely adverse economic considerations, or physical limitations.

**Interdisciplinary Team**

Two or more natural resource planners who use relevant information to develop alternative design and comparison for a proposed project. The team insures the integrated use of environmental, social, and economic information is clearly presented so the best decision can be made.

**Intermediate Stand Treatment**

A stand management treatment that manipulates stand growth, composition, structure, or tree quality. Intermediate treatments include thinning, pruning, release, salvage, and sanitation cutting. These stand treatments do not attempt to obtain new tree regeneration. Some treatments such as salvage cutting or commercial thinning result in the harvest of forest products.

**Landform**

Features that make up the surface of the earth. Broad features include mountains or large river valleys, and plains. Minor features would include areas such as individual stream channels or hillslopes.

**Land Use Designation**

A defined area of land specific to which management direction is applied in the Forest Plan.

**Large Woody Debris (LWD)**

Any piece of relatively stable woody material having a small-end diameter of at least 10 centimeters and a length greater than one meter that intrudes into the stream channel.

**Local Road**

A forest road that connects terminal facilities with forest collector, forest arterial, or public highways. Usually forest local roads are single purpose transportation facilities and can either be long or short term in nature.

**Logging Costs**

All costs associated with delivering logs to a milling facility.

**Log Transfer Facility**

A facility that is used for transferring commercially harvested logs to and from a vessel or log raft. It is wholly or partially constructed in waters of the United States and location and construction are regulated by the 1987 Amendments to the Clean Water Act. Formerly termed terminal transfer facility.

**Logging Camp**

A temporary facility established to house industry and Forest Service personnel while timber harvest occurs in the area.

## **Mass Failure**

The downslope movement of a block or mass of soil. This usually occurs under conditions of high soil moisture, and does not include individual soil particles displaced as surface erosion.

## **Mass Wasting**

A general term for the dislodgment and down slope transport of soil and rock material by gravity. Mass wasting is often used interchangeably with the term landslide.

## **MBF**

Abbreviation for thousand board feet of timber. One board foot is equivalent to a plank one-foot square and one inch thick; it contains 144 cubic inches of wood.

## **MMBF**

Abbreviation for million board feet of timber. One board foot is equivalent to a plank one-foot square and one inch thick; it contains 144 cubic inches of wood.

## **Mean Annual Increment**

The total volume of a tree or stand divided by the stand age. Stand volume is usually expressed in cubic feet or board feet per acre per year.

## **Mid Market**

Timber markets have historically been subject to both high and low cycles and will probably do so in the future. In order to incorporate these variations a "normal" or mid-market which represents average long term conditions is developed.

## **Mitigation**

Includes avoiding an impact altogether by not taking a certain action or part of an action; minimizing an impact by limiting the degree or magnitude of an action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or compensating for the impact by replacing or providing substitute resources or environments.

## **Multiple Entry**

More than one stand or land treatment activity during a rotation of a stand or area.

## **National Environmental Policy Act of 1969**

An act declaring a National policy to encourage productive harmony between humans and their environment, to promote efforts which will prevent or eliminate damage to the environment and the biosphere and stimulate the health and welfare of humans, to enrich the understanding of the ecological systems and natural resources important to the Nation and to establish a Council on Environmental Quality.

## **National Forest Management Act**

A law passed in 1976 that amends the Forest and Rangeland Renewable Resources Planning Act and requires the preparation of Forest plans.

## **Natural Range of Variability**

The range of variability in climate, vegetative cover, geologic processes, and soil formation influencing a given landscape has over time. Timeframes relative to this document are less than 600 years, not geologic time frames that encompasses far greater variability.

## **"No Action" Alternative**

The most likely condition expected to exist in the future if current management direction would continue unchanged.

**Non-Forest**

Land that has never supported forests and lands formerly forested but now developed for non-forest uses.

**Notice of Intent**

The Notice of Intent (NOI) to produce an EIS for the Crane and Rowan Mountain Timber Sales was published in the *Federal Register* in August of 1997.

**Old-Growth Habitat**

Wildlife habitat managed to maintain old growth forest characteristics through the planning period.

**Operability**

Timber suitable for harvest and transport to a market.

**Pond Log Value**

The difference between the end product selling value and manufacturing costs: the value of logs as they are delivered at the mill.

**Potential Yield**

The potential yield for the next ten years is the maximum harvest that could be planned to achieve the optimum perpetual sustained-yield harvesting level attainable with intensive forestry on regulated areas considering productivity of the land, conventional logging technology, standard cultural treatments and interrelationships with other resources uses and the environment.

**Precommercial Thinning**

An intermediate stand treatment used to remove immature or undesirable trees, and to reduce competition and promote diameter growth on the remaining trees. Precommercial thinning is also used to extend the time before canopy closure shades out shrubs and forbs.

**Recreation Opportunity Spectrum (ROS)**

A system for planning and managing recreation resources that categorizes recreation opportunities into the following seven classes:

*Primitive:* A natural environment of fairly large size. Interaction between users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls.

*Semi-Primitive Motorized:* A natural or natural-appearing environment of moderate to large size. Interaction between users is low, but there is often evidence of other users. The area is managed to minimize on-site controls and restrictions. Local roads used for other resource management activities may be present.

*Semi-primitive Non-Motorized:* A natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed to minimize on-site controls and restrictions. Use of local roads for recreational purposes is not allowed.

*Roaded Natural:* A natural-appearing environment with moderate evidence of the sights and sounds of man. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high with evidence of other users prevalent. Motorized use is allowed.

*Roaded Modified:* A natural environment that has been substantially modified particularly by vegetative manipulation. There is strong evidence of roads and/or highways. Frequency of contact is low to moderate.

*Rural:* A natural environment that has been substantially modified by development of

## 6 Glossary

structures, vegetative manipulation. Structures are readily apparent and may range from scattered to small dominant clusters. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high.

*Urban:* Urbanized environment with dominant structures, traffic lights, and paved streets. High concentration of people, and sights and sounds of human activity are acceptable.

### **Recreation Places**

Identified geographical areas having one or more physical characteristics that are particularly attractive to people in recreation activities. They may be beaches, streamside or roadside areas, trail corridors, hunting areas of the immediate area surrounding a lake, cabin site, or campground.

### **Redd**

Nest made in gravel, consisting of a depression hydraulically dug by a fish for egg deposition and then refilled with gravel.

### **Reserves**

A general term for an area of land recognized for, and managed to preserve or maintain, specific natural features. Wilderness is one common example. In the context of wildlife or fish habitat management, or biological diversity, an area set-aside for the maintenance and perpetuation of its habitat or ecosystem features.

### **Right-of-way**

The privilege which a person or persons may have of passing over the land of another.

### **Roads, Forest Development (or Specified)**

A road, including related transportation facilities and appurtenances, shown on the Sale Area Map and listed in the Timber Sale Contract.

### **Roads, Temporary (or Spur)**

Any short-lived road not intended to be a part of the forest development transportation system and not necessary for future resource management. After a temporary road has served its purpose, the timber sale operator will remove bridges and culverts, eliminate ditches, outslope roadbed, remove ruts and berms, effectively block the road to normal vehicular traffic, and build cross ditches and waterbars.

### **Rotation**

The planned number of years (approximately 100 years in Alaska) between the time that a forest stand is regenerated and its final cutting at a specified stage of maturity.

### **RPA**

Forest and Rangeland Renewable Resources Planning Act of 1974.

### **Salvage Cutting**

Cutting primarily to utilize dead/down trees will not be marketable if left in the stand until the next scheduled harvest. Salvage sales must contain more than 50 percent by volume of dead, insect infested, or windthrown timber.

### **Sawlog**

A log considered suitable in size and quality for producing sawn timber.

### **Section 810**

Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA) requires evaluation of Forest management impacts on subsistence uses and determinations regarding their significance. Reasonable steps to minimize adverse impacts upon subsistence uses and

resources are provided for by the forest-wide standards and guidelines for subsistence as well as related standards and guidelines for riparian areas, fish, and wildlife.

### **Seed Tree Regeneration Method**

A regeneration method where trees are left on site to provide seed to establish the new stand. Seed trees usually have good form, produce seed, are of the desired species, and are spaced to ensure adequate seed distribution. After the new seedlings are established the seed trees can be left or harvested.

### **Shelterwood Regeneration Method**

This regeneration method provides overstory shelter so young seedlings can become established. The seedlings can originate from planting or natural regeneration. Shelterwood trees are usually removed after the seedlings are established.

### **Silviculture**

The science and art of growing and tending crops of forest trees to attain the desired level of marketable and unmarketable products.

### **Silviculture Prescription**

A written technical document, that provides detailed direction for manipulating vegetation and monitoring treatments. A prescription is prepared after a preferred treatment alternative has been selected, but before the project is implemented. A prescription is prepared by a silviculturist to achieve the objectives established by the interdisciplinary team.

### **Slash**

Debris left over after a logging operation, i.e., limbs, bark and broken pieces of logs.

### **Soil Hazard Areas**

Mapped areas within which various soil hazards may be encountered. Hazards include mass failures and high sediment production during road construction.

### **Spawning Area**

The available area in a stream course, which is suitable for the deposition and incubation of salmon or trout, eggs.

### **Species Diversity**

The number of different species occurring in a location or under a similar environmental condition.

### **Specified Road**

Those roads including related transportation facilities listed in timber sale contracts for construction or reconstruction by the timber purchaser in accordance with locations and specifications provided by the Forest Service. Those Forest Development roads planned for recurrent land management uses and for which the timber sale contract specified the location, standards, and specifications. Specified roads are sometimes referred to as permanent roads.

### **State Historic Preservation Officer (SHIPO)**

The official appointed or designated pursuant to Section 101(b)(1) of the National Historic Preservation Act of 1966, as amended, to administer the State Historic Preservation Program.

### **Stream Classification System**

A means to categorize stream channels based on their fish production values. There are three stream classes on the Tongass National Forest. They are:

*Class I:* Streams with anadromous (fish ascending from oceans to breed in freshwater) or adfluvial (fish ascending from freshwater lakes to breed in streams) lake and stream fish habitat. Also included is the habitat upstream from migration barriers known to

be reasonable enhancement opportunities for anadromous fish and habitat with high value resident sport fish populations.

*Class II:* Streams with resident fish populations and generally steep (often 6-15 percent) gradient (can also include streams from 0-5 percent gradient where no anadromous fish occur). These populations have limited sport fisheries values. These streams generally occur upstream of migration barriers or are steep gradient streams with other habitat features that preclude anadromous fish use.

*Class III:* Streams with no fish populations but have potential water quality influence on the downstream aquatic habitat.

*Class IV:* Other intermittent, ephemeral, and small perennial streams with no fish populations and insufficient flow or sediment transport capabilities to have and immediate influence on downstream water quality or fish habitat.

## **Streamside Riparian**

The area including a stream channel, lake, or estuary bed, the water itself, and the plants that grow in the water and on the land next to the water.

## **Stumpage**

The value of timber as it stands uncut in terms of amount of value per thousand board feet.

## **Subsistence**

The term "subsistence uses" means the customary and traditional uses by rural Alaska residents of wild renewable resources for direct, personal, or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of non-edible byproducts of fish and wildlife resources taken for personal or family consumption; and for barter, or sharing for personal or family consumption; and for customary trade.

## **Temporary Road**

Roads constructed for a single purpose and short-term use. Once use of the road has been completed, it is obliterated, and the land it occupied is returned to production.

## **Thousand Board Foot Measure**

A method of timber measurement in which the unit is equivalent to 1,000 square feet of lumber one inch thick. It can be abbreviated as MBF.

## **Threshold of Concern**

The point or level of activity beyond which an undesirable environmental response is more likely to occur.

## **Timtype**

Timber type maps provide complete coverage of the Tongass National Forest. These maps were completed in 1978 and updated for the forest inventory between 1982 and 1984. In October 1993, the timber type map information, along with the forest inventory, was identified as the source for the timber resource information needed for the Revised Forest Plan. TIMTYPE is the digitized timber type information stored in the computerized Geographic Information System (GIS).

## **Tongass Land Management Plan (TLMP)**

The land allocation plan for the Tongass National Forest which serves to direct and coordinate further planning on the Forest as well as the uses carried on within the Forest on a day-to-day basis. TLMP provides management direction for a period of ten years.

## **Tongass Resource Use Cooperative Study (TRUCS)**

A compilation of subsistence data for evaluating the effects of the Forest Service's action contemplated in the revision of the regional Tongass Land Management Plan.

**Transportation Network**

All existing and proposed roads, trails, air fields, and other transportation facilities wholly or partly within or adjacent to and serving the National Forests and other areas administered by the Forest Service or intermingled private lands.

**Uneven-aged Stand Management**

A forest stand management strategy which results in trees of at least 3-tree age classes. Relatively frequent harvest entries remove mature and immature trees either singly (individual tree selection) or in-groups (group selection). Natural regeneration usually occurs soon after each harvest entry. Intermediate stand treatments are usually performed when the harvest entry occurs. Stand regulation or management is accomplished by manipulating stand density, stand structure, species composition, re-entry periods, and maximum tree age. Biological diversity is generally greater within an uneven-aged stand than within an even-aged stand.

**Utility Logs**

Those logs, which do not meet sawlog grade, but are suitable for production of firm useable pulp chips.

**V-Notch**

A relatively narrow, steep, V-shaped stream channel generally on steep, mountainous terrain.

**Value Comparison Unit (VCU)**

A distinct geographic area that generally encompasses a drainage basin containing one or more large stream systems. Boundaries usually follow easily recognizable watershed divides. These units were established on the Tongass National Forest to provide a common set of areas for which resource inventories could be conducted and resource value interpretations made.

**Visual Priority Travel Rout or Use Area**

Viewing locations from which scenic impacts are assessed, typically defining where the greatest concern for scenic quality exists.

**Visual Quality Objective (VQO)**

A desired level of scenic quality and diversity of natural features based on physical and sociological characteristics of an area. Refers to the degree if acceptable alterations of the characteristic landscape.

*Inventory VQO:* Derived through application of the USDA Visual Management System. Uses three elements to determine the inventory: Sensitivity levels, distance zones, and landscape variety class. Provides a benchmark and illustrates the optimum objective based on current use patterns and sensitivity.

*Adopted VQO:* The VQO to be achieved as a result of management direction identified in the approved forest plan. Adopted VQO's represent the visual resource objective for the Forest Land Management Plan period, normally 10 years

*Preservation:* Management activities are generally not allowed in this setting. The landscape is allowed to evolve naturally.

*Retention:* Management activities are not evident to the casual forest visitor.

*Partial Retention:* Management activities may be evident, but are subordinate to the characteristic landscape.

*Modification:* Management activities may dominate the characteristic landscape but will, at the same time, use naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed as middleground (1/4 to 5 miles from viewer).

## 6 Glossary

*Maximum Modification:* Management activities may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background.

### **Viewshed**

A term used by landscape architects to infer a geographically distinct landscape that people can view or perceive as a single unit.

### **Volume**

Stand volume based on standing net board feet per acres by Scribner Rule.

### **Volume Class**

Average timber stand volume, given as thousand board feet per acre. The volume classes used in this EIS are: 8 to 20, 20 to 30, 30 to 50, and 50+ MBF/acre.

### **Volume Strata**

Division of timber volume derived from the interpreted timber type data layer (TIMTYP) and the common land unit data layer (CLU). Three volume strata (low, medium, and high) are recognized in the Forest Plan.

### **Watershed**

The area that contributes water to a drainage or stream.

### **Watershed Analysis**

A systematic procedure for characterizing and evaluating watershed response. Factors likely to influence watershed response are used to indicate anticipated effects. Past, present, and proposed actions are considered.

### **Wetland**

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

### **Wilderness**

Any large tract of land uncultivated and uninhabited by human beings, where the earth and its biotic community is untrammelled by humans, where humans are the visitors who do not remain.

### **Wildlife Habitat**

The locality where the species may be found and where all essentials for its development and existence are present.

### **Windthrow (Blowdown)**

Trees uprooted or snapped off by the wind. There are generally three types of windthrow – endemic where individual trees are blown over; catastrophic where major windstorms can blowdown hundreds of acres; and management related where the clearing of trees in an area make the adjacent trees more vulnerable to blowdown.

# **Chapter 7**

## **Literature Cited**

# Chlorine

Chlorine is a chemical element with the symbol Cl and atomic number 17. It is a halogen and is found in the periodic table in group 17. Chlorine is a yellow-green gas at room temperature and is highly reactive. It is used in a variety of applications, including water treatment, disinfection, and the production of plastics and other chemicals.

# Chapter 7

## Literature Cited

- Alaback, P.B. 1982. Forest Community Structural Changes During Secondary Succession in Southeast Alaska. In: Forest succession and stand development research in the Northwest: proceedings of the symposium; 1981 March 26; Corvallis, Or. Corvallis, Or.: Forest Research Laboratory, Oregon State University; 1982.
- Anderson B. and D. F. Potts. 1987. Suspended Sediment and Turbidity Following Road Construction and Logging in Western Montana. Water Resources Bulletin 23:4 691-690.
- AWRTA v. Morrison. 1996. Settlement agreement resulting from Alaska Wilderness Recreation and Tourism Association, et al., vs. Gary Morrison. US District Court, District of Alaska.
- Bartos, L. R. 1989. A new look at low flows after logging. In Alexander, E. B., editor, Proceedings of Watershed 1989, a conference on stewardship of soil, air, and water resources. R10-MB-89. U.S. Forest Service, Tongass National Forest. Ketchikan, AK.
- Bevenger, and King, 1995. A pebble count procedure for assessing watershed cumulative effects. USDA Forest Service, Research Paper RM-Rp-319, 17p.
- Bilby, R. 1985. Contributions of road surface sediment to a western Washington stream. Forest Science, Volume 31:827-838.
- Bormann F. H., M. H. Spadtenstein, M. A. McClellan, F. C. Ugolini, J. R. Cromack and S. M. Nay. 1995. Rapid soil development after windthrow disturbance in pristine forests. Journal of Ecology, 83:747-757.
- Burroughs E. R. Jr. and J. G. King, 1989. Reduction of soil erosion on forest roads. USDA Forest Service, General Technical Report INT-264, 21p.
- Campbell, T. M. III, 1979. Short-term effects of timber harvests on pine marten ecology. M. S. Thesis, Colorado State University, Fort Collins, Colorado. 71p.
- Conlan, K.E. and D.V. Ellis, 1979. Effects of wood waste on sand beds benthos. Marine Pollution Bulletin 10:262-267.
- DeGayner, E. and K. Hastings, 1996. Northern Flying Squirrel and Ermine Habitat Use in Southeast Alaska: An Administrative Study. USDA Forest Service, Alaska Region.
- Flynn, R. and G. Blundell., 1992. Ecology of Martens in Southeast Alaska. ADF&G Division of Wildlife conservation. Juneau, AK.
- Flynn, R. 1995. Marten habitat capability model revisions. ADF&G, Division of Wildlife Conservation letter dated November 29, 1995 to Chris Iverson, USDA Forest Service, Alaska Region. Juneau. 3 pp.

# 7 Literature Cited

- Freese L. J. and C. E. O'Clair. 1987. Reduced survival condition of bivalves *Prothaca staminea* and *Mytilus edulis* buried by decomposing bark. *Marine Environmental research* 23: 49-64.
- Harris, A. S. 1989. Wind in the forests of southeast Alaska and guides for reducing damage. Gen. Tech. Rep. PNW-GTR-244. Portland OR. USDA Forest Service, Pacific Northwest Research Station. 63 pp.
- Hunter M. L., Jr. 1990. *Wildlife, Forests, and Forestry: Principles of Managing Forests for Biological Diversity*. Prentice Hall. 370pp.
- Iverson, G. C, G. D. Hayward, K. Titus, E. DeGayner, R. I. Lowell, D. C. Crocker-Bedford, P. F. Schempf and J. Lindell. 1996. Conservation Assessment for the Northern Goshawk in Southeast Alaska. USDA Forest Service, Juneau, AK.
- Kramer M. E. 1997. Abiotic Controls on Windthrow and Forest Dynamics in a Coastal Temperate Rainforest, Kuiu Island, Southeast Alaska. M. S. Thesis, Montana State University, Bozeman, MT. 45p.
- McCorison, M., E. Kissinger, and G. Johnjack. 1989. A method to analyze watershed sensitivity. Unpublished study, USDA Forest Service, Tongass National Forest, Stikine Area, Petersburg, Alaska.
- Meslow, C. E., C. Maser, and J. Verner. 1981. Old-growth forests as wildlife habitat. *Transactions of the North American Wildlife and Natural Resources Conference* 46:329-335.
- Nowacki G. J. and M. G. Kramer, 1997. The Effects of Wind Disturbance on Temperate Rain Forest Structure and Dynamics of Southeast Alaska. USDA Forest Service, Pacific Northwest Research Station, Portland, OR. General Technical Report. PNW-GTR-(Draft) In press.
- O'Clair, C. and L. Freese. 1984. Lethal and sub-lethal responses of Dungeness crabs (*Cancer magister*) to bark from log transfer facilities. Paper presented at the American Fisheries Society, Alaska Chapter, November 12-15, 1984. Juneau, Alaska.
- Oliver C. D. 1995. Forest Stand Dynamics with emphasis on Alaska. A workshop 13-15 June 1995. Wrangell, AK.
- Oliver C. D. and B. C. Larson, 1996. *Forest Stand Dynamics – Updated Edition*. John Wiley and Sons, Inc., New York.
- Person D. K. and R. T. Bowyer. 1997 *Population Viability Analysis of Wolves on Prince of Wales and Kosciusko Islands, Alaska*.
- Person D. K., M. Kirchhoff, V VanBallenberghe and R. T. Bowyer. 1997. Letter to Beth Pendleton, Tongass Land Management Planning Team concerning the Forest Plan Wolf Assessment and some of the conclusions drawn in the Forest Plan. September 19, 1997.
- Pojar J. and A. Mackinnon. 1994. *Plants of the Pacific Northwest Coast, Washington, Oregon, British Columbia and Alaska*. B. C. Ministry of Forests. Lone Pine Publishing, Canada. 528 p.
- Reiser, D.W. and T.C. Bjornn. 1979. Habitat requirements of anadromous salmonids. USDA Forest Service, PNW General Technical Report ONW-96, October 1979.
- Salo, E.O. and T.W. Cundy. 1987. *Streamside Management: Forestry and Fishery Interactions*. University of Washington, Institute of Forest Resources. P.113.

- Sealaska Corporation. 1975. Native Cemetery and Historic Sites of Southeast Alaska. Preliminary Report. Sealaska Corporation, Juneau, Alaska.
- Sedell, J. R. and W. S. Duval. 1985. Influence of Forest and Rangeland Management on Anadromous Fish Habitat in Western North America., Water transportation and storage of logs. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, General Technical Report PNW-186, 68p.
- Sheridan, W.L. et. al. 1984. Sediment content of streambed gravels in some pink salmon spawning streams in Alaska. In Fish and Wildlife Relationships in Old-Growth Forests. Proceedings of a symposium; Juneau, AK American Institute of Fishery Research Biologists. P. 153-165.
- Shultz, R. D. and R J. Berg. 1976. Some effects of log dumping on estuaries. NOAA, National Marine Fisheries Service, Juneau, Alaska.
- Smith, D. M. 1962. The Practice of Silviculture, seventh edition. John Wiley and Sons, Inc. New York. 578p.
- Soutiere, E. C. 1979. Effects of timber harvesting on marten in Maine. Journal of Wildlife Management 43:850-860.
- Spencer, W. D. 1987. Seasonal rest-site preferences of pine martens in the northern Sierra Nevada. Journal of Wildlife Management 51:616-621.
- Suring, L. H., A. T. Doyle, R. W. Flynn, D. N. Larsen, M. L. Orme and R. E. Wood. 1988. Habitat capability model for river otter in southeast Alaska: spring habitat. USDA Forest Service, Region 10. Juneau, Alaska.
- Swanston D. N. and Marion. 1991. Landslide response to timber harvest in southeast Alaska. Proceedings of the Fifth Federal Interagency Sedimentation Conference, chapter 10:49-55.
- Thomas J. W., E. D. Forsman, J. B. Lint, E. C. Meslow, B. R. Noon and J. Verner. 1990. A Conservation Strategy for the Northern Spotted Owl. Interagency Committee to Address the Conservation of the Northern Spotted Owl. USDA Forest Service, USDI Bureau of Land Management, Fish and Wildlife Service and National Park Service. 1990-791-171-20026. U. S. Government Printing Office. Washington D. C.
- TLMP. 1997. Tongass Land and Resource Management Plan, includes the Final Environmental Impact Statement, Record of Decision, Appendices A through N, and the Map Packet. USDA Forest Service, R10-MB-338.
- University of Alaska, U.S. Forest Service. 1990. Subsistence Use of Renewable Resources by Rural Residents of Southeast Alaska (TRUCS). University of Alaska, Institute of Social and Economic Research.
- US Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service. 1997. Threatened and endangered species biological opinion. Letter dated December 29, 1997 from Steve Pennoyer, NMFS, to Patricia Grantham.
- USCOE. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-878-1, 100p, Illus. Appendix. Washington D.C.
- USDA Forest Service. 1983. Alaska Regional Guide. Alaska Region Report Number 126, USDA Forest Service. Juneau, Alaska.
- USDA Forest Service. 1986. Forest Service Handbook 2609.24, Aquatic Habitat Management Handbook. Appendix 68.1.

## 7 Literature Cited

- USDA Forest Service. 1988. Forest Service Handbook 7709.55, Transportation Planning Handbook. Section 33.
- USDA Forest Service. 1990. Forest Service Manual 2300, WO Amendment 2300-90-1. Section 2380.3.
- USDA Forest Service. 1991. Queen Charlotte Goshawk, Status Report for R10 Sensitive Species Consideration. Excerpt from larger document of species considered for recommendation to the Regional Forester's Sensitive Species List. December, 1991, Region 10.
- USDA Forest Service. 1992a. Ecological definitions for old-growth forest types in southeast Alaska. U.S. Forest Service, Alaska Region, R10-tp-28, 1992.
- USDA Forest Service. 1992b. Soil Quality Standards, Forest Service Manual 2500, Watershed and Air management, R10 Supplement No. 2500-92-1, pg. Code 2554.
- USDA Forest Service. 1993. North and East Kuiu Final Environmental Impact Statement. Tongass National Forest. R10-MB-205 through 209.
- USDA Forest Service. 1995a. Anadromous Fish Habitat Assessment – Report to Congress, USDA Forest Service PNW Research Station Alaska Region, R10-MB-279, January 1995.
- USDA Forest Service. 1995b. Annual monitoring and evaluation report, Tongass National Forest. R10-MB-323.
- USDA Forest Service. 1996. Soil and water conservation handbook. R10 Amendment No. 2509.22-96-1.
- USDA Forest Service. 1997a. Watershed analysis handbook. Alaska Region. Draft Version 2, 36p.
- USDA Forest Service. 1997b. Fisheries resource report. Internal Report for Crane and Rowan Project. Tongass National Forest, Stikine Area. Petersburg, Alaska.
- USDA Forest Service. 1997c. Soil resource report. Internal Report for Crane and Rowan Project Tongass National Forest, Stikine Area. Petersburg, Alaska.
- USDA Forest Service. 1997d. Subsistence specialist report. Internal Report for Crane and Rowan Project. Tongass National Forest, Stikine Area. Petersburg, Alaska.
- USDA Forest Service. 1997e. Wildlife specialist report. Internal Report for Crane and Rowan Project Tongass National Forest, Stikine Area. Petersburg, Alaska.
- USDA Forest Service. 1997f. Watershed analysis of Dean Creek, Kuiu Island. Internal Report. Tongass National Forest, Stikine Area. Petersburg, Alaska
- USDA Forest Service. 1997g. Watershed analysis of Security Creek, Kuiu Island. Internal Report. Tongass National Forest, Stikine Area. Petersburg, Alaska
- USDA Forest Service. 1997h. Timber specialist report. Internal Report for Crane and Rowan Project Tongass National Forest, Stikine Area. Petersburg, Alaska.
- USDA Forest Service. 1997i. Stikine Area Ten-Year Sale Schedule. Internal Report. Tongass National Forest, Stikine Area. Petersburg, Alaska
- USDA Forest Service. 1997j. Crane and Rowan Mountain Timber Sale NEPA Process, TLMP Transition Consultation Meeting. Letter dated October 14, 1997, from Robert Gerdes to Abigail Kimbell.

USDA Forest Service. 1998. Biological Evaluation for Forest Service Sensitive Animal Species for the Crane and Rowan Mt. EIS. Tongass National Forest, Stikine Area. Petersburg, Alaska.

USDI Fish and Wildlife Service. 1997. Threatened and Endangered species biological opinion. Letter dated October 22, 1997, from John Lindell, F&WS, to Patricia Grantham.



# **Chapter 8**

## **Index**

# Chapter 5

10/10/10

# Chapter 8

## Index

### A

Alaska Coastal Zone Management, 1-12, 2-19, 6-1  
 Alternative development, 1-10  
 ANILCA, 1-1, 1-12, 2-19, 3-61, 3-62, 3-67, 6-1, 6-2, 6-10  
 AWRTA, 1-1, 1-8, 1-9, 7-1

### B

Bach fringe, 1-5, 3-6, 3-8, 3-18, 3-76, 3-77, 3-78  
 Best Management Practices, 2-18, 2-21, 3-32, 3-36, 6-1, 6-3, 3, 5  
 Biodiversity, 3-6, 3-7  
 Black bear, 3-3, 3-8, 3-19, 3-25, 3-26, 3-46, 3-49, 3-57, 3-61, 3-67  
 Buffer strips, 2-18, 3-60, 3-76, 3-77, 3-78

### C

Cave, 1-12, 3-49, 3-56, 3-76  
 Cultural Resources, 2-18  
 Cumulative Effects, 3-32, 3-52, 7-1

### E

Eagle, 2-19, 3-6, 3-8, 6-5  
 Endemic Terrestrial Mammals, 1-7, 3-7, 3-16

### F

Forest Plan, 1-1, 1-2, 1-6, 1-7, 1-8, 1-9, 1-10, 1-11, 1-12, 1-13, 2-1, 2-8, 2-9, 2-10, 2-14, 2-18, 2-19, 2-20, 3-6, 3-7, 3-8, 3-9, 3-13, 3-14, 3-15, 3-16, 3-17, 3-26, 3-27, 3-28, 3-31, 3-32, 3-33, 3-36, 3-42, 3-45, 3-46, 3-47, 3-48, 3-52, 3-57, 3-60, 3-63, 3-67, 3-69, 3-86, 6-2, 6-7, 6-12, 6-14, 7-2, 7-3, 7-4, 2, 1  
 Forest Plan Direction, 1-7

### G

Goshawk, 1-7, 1-10, 2-18, 3-9, 3-20, 3-27, 7-4

### H

Habitat Conservation, 1-2, 1-8, 1-10, 2-2, 3-5  
 High Hazard Soil, 3-40, 3-55

### L

Log Transfer Facility, 1-8, 2-14, 2-15, 3-15, 3-16, 3-70, 3-72, 6-2, 6-7  
 Logging Camp, 3-50, 3-67

### M

Marbled Murrelet, 2-18, 3-27, 3-28  
 Marten, 1-7, 1-10, 3-1, 3-2, 3-3, 3-8, 3-16, 3-19, 3-20, 3-22, 3-24, 3-25, 3-26, 7-1, 7-3  
 Mitigation, 1-9, 2-1, 2-18, 2-19, 2-21, 3-78  
 Monitoring, 1-9, 2-20, 2-21, 3-61, 3-70, 3-71, 3-72, 3-77, 3-78, 6-11, 7-4, 4

### N

Natural disturbance, 1-2, 1-8, 1-9, 1-10, 2-1, 2-2, 2-3, 2-6, 2-8, 2-10, 2-14, 2-21, 3-1, 3-2, 3-3, 3-6, 3-15, 3-17, 3-19, 3-20, 3-22, 3-24, 3-25, 3-39, 3-43, 3-53, 3-60, 3-80, 3-81, 3-82, 6-14, 7-1, 7-2  
 No Action Alternative, 1-2  
 North and East Kuiu FEIS, 1-1, 1-8, 3-36

### O

Old-growth, 1-7, 2-1, 2-6, 2-8, 2-19, 3-1, 3-2, 3-3, 3-5, 3-6, 3-7, 3-8, 3-9, 3-13, 3-17, 3-19, 3-20, 3-22, 3-25, 3-69, 6-4, 6-9, 7-2, 7-4

## P

Preferred Alternative, 1-2, 2-1, 2-19

## R

Recreation Opportunity Spectrum, 1-7, 3-55, 6-2, 6-9, 7-3

Rotation, 3-21, 3-26, 3-69, 3-80, 3-82, 6-8

## S

Scenery, 1-2, 1-10, 2-2, 3-45, 3-55

Scoping, 1-1, 1-9, 2-20

Sitka Black-tail Deer, 1-10, 2-23, 3-1, 3-2, 3-3, 3-5, 3-8, 3-9, 3-10, 3-13, 3-14, 3-15, 3-16, 3-19, 3-20, 3-22, 3-24, 3-25, 3-26, 3-57, 3-61, 3-63, 3-64, 3-67, 3-68, 3-69, 6-4, 6-6

State Historic Preservation Officer, 2-18, 3-73, 3-76, 3-77, 6-2, 6-11

Stream Class, 2-18, 3-2, 3-35, 3-36, 3-40, 3-59, 3-60, 3-61, 6-11, 6-12, 4

Subsistence, 1-1, 1-9, 1-10, 2-1, 2-19, 3-5, 3-

10, 3-13, 3-51, 3-61, 3-62, 3-63, 3-64, 3-67, 3-68, 3-69, 3-76, 6-2, 6-6, 6-10, 6-12

## T

Threatened, Endangered or Sensitive Species, 3-6, 3-16, 3-27, 3-28, 3-33, 3-45, 3-52, 3-78, 3-86, 7-3

Timber Economics, 1-2, 1-10, 2-2, 3-41

## V

Visual Quality Objective, 1-10, 1-12, 2-16, 2-18, 3-45, 3-47, 3-48, 3-49, 3-50, 3-51, 3-52, 3-53, 3-73, 3-76, 3-77, 6-2, 6-11, 6-13, 6-14

## W

Watershed Effects, 1-2, 1-10, 3-31

Wetland, 3-56, 3-57, 5

Whale, 3-28

Wolf, 1-10, 3-9, 3-13, 3-22, 3-26, 3-27, 3-28, 3-64, 3-67

# **Appendix A**

## **Unit Plans and Road Management Objectives**



# Appendix A

## Unit Plans and Road Management Objectives

### Unit Plan Summaries

**Introduction**

Unit plan summaries are intended to serve a dual purpose: (1) to disclose the site specific elements of the design unique to the unit in the NEPA process, and (2) to provide sufficient documentation so that timber sale layout teams can easily understand the unit's objectives as planned by the interdisciplinary team.

**Planning Process**

Unit planning is accomplished with an interdisciplinary process. The process is interactive in nature in that a preliminary plan is developed which is subjected to the scrutiny of Forest Service and other governmental agencies as well as interested individuals from the general public. Information gathered through this public involvement process is used to modify the original proposal to better address the collective concerns and objectives. Summaries of the results of the unit planning process are documented on the unit plan cards displayed below.

Unit plan summaries are intended to capture the site-specific elements of unit design unique to the individual unit. A timber harvest unit proposal results from an interdisciplinary planning process that must consider the resource objectives of all individuals concerned. The working documentation for a single harvest unit proposal can include a considerable quantity of working maps, resource surveys, logging skyline analysis, landscape management computer designs, and other related information. The unit plans presented here are a summarization of this larger body of supporting documentation. As such, it should be realized that each unit plan summary does not and cannot display all available supporting information. To fully see the total picture, within which a unit design evolved, one must look at all of the supporting documentation.

Elements of design that are common to all units have been grouped under separate headings and listed below before the unit plan summaries.

Unit plan summaries are presented in three sections:

**Unit Plan Summary Format**

**The Heading**

The heading includes unit number and pertinent geographical information

## Resource Concerns/Opportunities - Unit Management Objectives

This section provides site specific information unique to the unit and the objectives identified to address the resource concerns and opportunities that focused the design process. The absence of a resource indicates that the resource was not a concern in the unit.

## Implementation Activities

This section provides a summary of site specific resource information unique to the area associated with the unit that was important and necessary for the design.

## Transportation System

This section describes the planned access to the unit, in particular, whether the roads required will be specified forest development roads or temporary spurs.

## Silvicultural Prescription Summary

This section provides a summary of the silvicultural prescription developed to achieve the land management objective.

## Unit Design

This section describes the site-specific features of the unit design that were developed by the IDT to address the identified concerns. Some elements of design that are not unique but must be considered for all units are not included in the summaries. They are grouped into the following categories and described below:

- Laws and Regulations
- Timber Sale Contract Provisions
- Ecosystem Management
- Logging Engineering Requirements
- Road Engineering Requirements

## Laws and Regulations

All laws and regulations pertinent to the management of the National Forest System are considered in the design of harvest units. While not listed on each in the summaries for each unit plan they provide the framework for the interdisciplinary process and the overall guidance for developing the plans.

## Timber Sale Contract Provisions

A contract provision that will be used to implement the harvest proposal deal with riparian stream habitat protection requirements of the Tongass Timber Reform Act of 1990 and Forest Plan Standards and Guidelines and is copied below:

CT6.51# - Streamcourse Protection 9/97. Streamcourses or associated Streamcourse Protection zones subject to this provision are designated on the Sale Area Map and marked on the ground using Blue/White, Red/White, Orange/White or Green/White striped ribbon. Unless waived or agreed otherwise in writing, such Streamcourses are subject to the following:

(a) Included Timber designated for removal along streamcourses marked on the ground with Blue/White or Red/White or Orange/White striped ribbon shall be directionally felled away from streams. Felling may be accomplished by wedging, jacking, lining, or otherwise pulling when necessary to meet this directional requirement. Blue/White flagged Streamcourses are shown on the Sale Area Map with the symbol "a", Red/White flagged Streamcourses are shown on the Sale Area Map with the symbol "b" and Orange/White flagged Streamcourses are shown on the Sale Area Map with the symbol "c". Trees, logs or

## Elements Common to All Units

other products shall not be hauled or yarded across streamcourses without prior written approval of Forest Service. Such trees, logs or other products hauled or yarded across streamcourses shall meet the suspension requirements in CT6.42#. If trees or portions of trees are inadvertently felled in or otherwise placed in Streamcourses as a result of Purchaser's operations, Forest Service may designate such material to be removed or to remain unyarded in the streamcourse. Trees or portions of trees to be left in streamcourses shall be clearly identified by Forest Service prior to yarding.

(b) Purchaser's operations shall be conducted to prevent debris from entering Streamcourses, except as authorized under paragraph (c). In event Purchaser causes debris to enter Streamcourses other than those authorized under paragraph (c) in amounts which may adversely effect the natural flow of the stream, water quality or fishery resource, Purchaser shall remove such debris as soon as practicable, but not to exceed 48 hours, and in an agreed manner that will cause the least disturbance to Streamcourses.

(c) Included Timber designated for removal along streamcourses marked on the ground with Green/White striped ribbon shall, in so far as practical, be felled and yarded away from streamcourses. Green and White flagged Streamcourses are shown on the Sale Area Map with the symbol "d". Trees that can not be felled away from the streamcourse will be felled to bridge the stream provided those trees will be removed during the same operating season. Trees felled to bridge streamcourses shall be bucked, limbed and topped away from the streamcourse and its banks.

(d) Culverts or bridges shall be required on Temporary Roads at all points where it is necessary to cross Streamcourses identified in (a). Such facilities shall be of sufficient size and design and installed in a manner to provide unobstructed flow of water and to minimize damage to Streamcourses.

(e) Wheeled or track-laying equipment shall not be operated in Streamcourses except at crossings designated by Forest Service or as essential to construction or removal of culverts and bridges.

(f) Flow in Streamcourses may be temporarily diverted only if such diversion is necessary for Purchaser's planned construction and Forest Service gives written authorization. Such flow shall be restored to the natural course as soon as practicable and in any event prior to a major storm runoff period or runoff season.

(g) Purchaser's operations are to be conducted according to Best Management Practices as defined in Forest Service Handbook 2509.22.

It was felt, by the IDT, that the "full suspension" requirement needs further clarification to avoid confusion during the implementation process. Yarding across streams described is normally avoided by locating divisions between cable yarding settings (splitlines) on the streamcourses so that trees will be yarded away from streamcourses. Because of the meandering nature of some streamcourses it is recognized that occasional logs may be yarded across the streamcourse during the normal yarding operation.

It is also understood that where cable yarding splitlines are designed to minimize yarding of logs across streamcourses, non-merchantable trees will be left standing to help maintain streambank stability and occasionally merchantable trees may be left standing to achieve the objective of providing for biological diversity and reserve tree retention needed for wildlife.

Ecosystem management is an evolving concept that has recently been addressed by the Forest Service on a nationwide basis. Region 10 has developed an implementation strategy that embodies the concepts formalized by the Chief of the Forest Service. The goal is to provide silvicultural prescriptions for each proposed harvest unit that considers the larger ecosystem

context within which the unit lays. As such, the individual unit plans will be used as a diagnostic tool for the development of silvicultural prescriptions prior to individual unit harvest. The silvicultural prescriptions will site specifically depict pre and post harvest silvicultural treatments of stands as they relate to ecosystem management strategies.

## Logging Engineering Requirements

It is assumed that unless otherwise stated in the unit plan design, Partial suspension is the yarding objective desired. All units are designed to meet at least the objective of partial suspension of logs when utilizing cable-logging systems. This includes the use of highlead systems where partial suspension can be achieved for only relatively short distances. Furthermore, unless otherwise stated the logging system is assumed to be the cheapest system that will meet this objective. This is normally a running skyline.

## Road Engineering Requirements

Special designs for crossing moderate and steep-sloped Class I streams are assumed for all roads. These are streams with a high risk of blocking migration of anadromous fish. Either bridges or special designed culvert pipes will be used. Culverts will be oversized squash pipes buried below the natural stream bottom, be fitted with baffles to hold stream gravel, and be sufficiently wide to cause no restriction of the stream bottom. See the road cards for further details.

## Road Management Objectives

### Purpose and Use

The road management objectives (RMO's) presented in this appendix establish the intended purpose, and display design, maintenance, and operation criteria (as per FSH 7709.55), for each road on the haul route of the timber sale. The presentation includes three sections for each road. The first section, which includes general design criteria and elements, maintenance, and operation criteria, is part of a permanent database that will be updated periodically as access needs, issues, and budgets change. The second section is a detailed listing of site specific design criteria that will be used extensively during design, construction, and initial monitoring of the new road construction proposed in this project. The third is a map showing the location of proposed new construction and identifying areas discussed in the site specific design criteria section.

### General Design Criteria

The general design criteria provide various descriptors of the type of road, and the intended purpose and future use of the road. From this information, the maintenance and operation criteria can be developed. This information is critical for determining whether a Corps of Engineer's permit will be required for segments of road crossing wetlands. Roads built solely for silvicultural purposes do not require these permits.

### Maintenance Criteria

The maintenance criteria include a discussion of how the road is to be maintained, centering on three strategies.

- **Active:** provide frequent cleanout of ditches and catchbasins to assure controlled drainage. Control roadside brush to maintain sight distance. Grade as needed to maintain crown and running surface.
- **Storm Proof:** provide waterbars, rolling dips, outsloping, etc., to assure controlled runoff until any needed maintenance can be performed on the primary drainage system. Control roadside brush to maintain passage.
- **Storage:** remove or bypass all drainage structures to restore natural drainage patterns, add waterbars as needed to control runoff, re-vegetate.

The active maintenance strategy is primarily intended to be applied to roads open and

maintained for travel by a prudent driver in a standard passenger car. User comfort and convenience are not considered priorities. These roads are assigned Maintenance Level 3. The active maintenance strategy will also at times be applied to roads intended only for use by high clearance vehicles, or Maintenance Level 2 roads. This will usually be the case when log haul is expected in the near future.

An intermediate maintenance strategy is to **stormproof** the road by providing roadway features such as driveable waterbars, and outsloping to control runoff in case the primary drainage system of culverts and ditches is overwhelmed during a storm event. Each culvert will be evaluated as to where the water would go if the culvert were to fail to carry the high flow. A waterbar or outslope at this location will minimize the potential of erosion of long stretches of ditchline or roadway. This is intended to be the primary maintenance strategy applied to roads assigned Maintenance Level 2.

**Storage** is intended to be the primary maintenance strategy applied on intermittent use roads during their closure cycle. Road storage is defined in FSH 5409.17 as “the process/action of closing a road to vehicle traffic and placing it in a condition that requires minimum maintenance to protect the environment and preserve the facility for future use”. In this strategy, bridges and culverts on live streams are completely removed to restore natural drainage patterns. Cross-drains and ditch relief culverts will be bypassed with deep waterbars but left in place to minimize the cost of reusing these roads in the future. Due to the isolated nature of the road system, which makes maintenance costly and difficult, and their infrequency of use, storage is the most appropriate strategy for these roads. Maintenance Level 1, closure and basic custodial maintenance, is assigned.

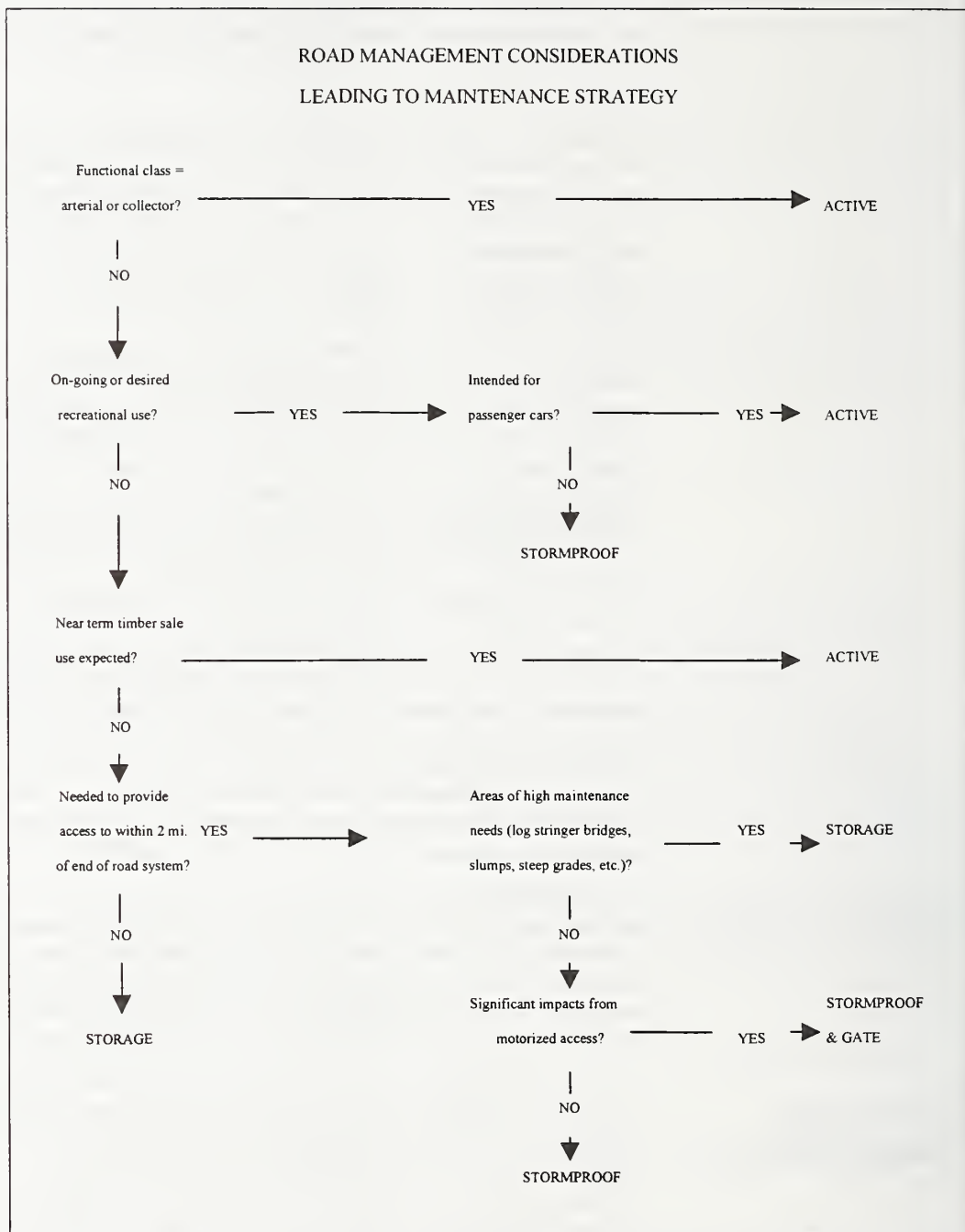
The interdisciplinary team went through a process defining road management considerations leading to the maintenance strategy to be applied to each road in the project area. The process is captured in the flow chart presented below. The map titled “Road Management Objectives: Maintenance Strategy” shows the desired future condition of each road in the project area as a result of following the displayed process. These objectives can be compared to the current condition of the roads shown on the alternative maps. The work needed to meet the objectives can be accomplished on the roads along the haul route in this timber sale. Work needed on other roads to meet the desired objectives will be scheduled as funding allows.

## Operation Criteria

The operation criteria include a presentation of each of the five traffic management strategies identified in FSH 7731 (encourage, accept, discourage, prohibit, and eliminate) to be applied to different traffic classes on each road. The traffic management narrative describes what actions will be taken to apply each strategy. For example, if the strategy “eliminate” is prescribed for standard passenger and high clearance vehicles, the narrative describes the method to accomplish this, such as removal of stream crossing structures, gating, etc.

## Site Specific Design Criteria

The site specific design criteria include road location objective, wetland information, erosion control and rock pit BMP's, and key stream crossing data. The road location discussion documents why the road is proposed in a specific location, control points, and alternative routes considered (if any). A main location objective is always to avoid crossing wetlands, however at times, it is necessary to minimize the total impact of a road. These areas are discussed, documenting areas of mapped wetlands and why the road is located across these areas. All fish streams are identified, as well as non-fish streams with sufficient flow to require a 48” or larger culvert. The stream crossing information describes the stream in enough detail to lead to a preliminary crossing structure recommendation and for a reviewer to evaluate the adequacy of the proposed structure.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 399-13.2

Management Prescription: **Timber Production**

Acres Even Aged: 64

Natural Stand Condition: **Understory Reinitiation/Oldgrowth**

Acres 2-Aged: 0

Desired Future Condition **Even aged**

Acres Uneven Aged 0

Volume(MBF) 2150.4

USGS 1/4 QUAD MAP #: **PTAD1 SW**

Aerial Photo: 77

Flight# 6

Photo# 93

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class II streams east of unit - maintain riparian buffer.  
Two Class III streams in unit - maintain streambank stability.  
Class IV within unit.  
South winds predominate - incorporate disturbance ecology principles.  
Possible unstable soils on upper slopes - maintain slope stability.  
Upper portion of unit visible from Saginaw Bay - Meet VQO of Modification

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Southern part of unit is old growth. Central and south part of unit is understory reinitiation. Class III stream protected by buffer in northern part of unit is old landslide track originating from steep ground above unit and is understory reinitiation with high spruce component.

##### **2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection.)

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Southeast winds predominate requiring special attention on the south sides of the V-notches. Both streams within the unit are in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch to provide for windfirmness. Windthrow has been recorded in the area from SE winds.

Class IV: Field reconnaissance has identified the potential for one or two small Class IV streams in the unit. Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Unit is in medium deer HSI value and high Marten HIS value. North facing slope below 800 feet in elevation.

##### **4. Visuals:**

Unit as designed meets VQO of Modification

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46251 runs to the last landing. It will continue past this unit in the future. To avoid wetlands as much as possible, an 800' segment of the road is located above the upper edge of a linear muskeg, but below the steeper ground located further upslope from the muskeg. This road will be put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) is same as (a) with uphill cable yarding system.

#### **D. UNIT DESIGN:**

Partial suspension on steep slope on south end of unit.  
Upper unit boundary is located at slope break to protect soils.  
Unit boundary parallels wind direction providing windfirmness.  
Recommend running skyline to minimize soil disturbance (BMP 13.9)  
The northeast unit boundary was designed to avoid small beaver ponds.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 399-13.3

Management Prescription: **Timber Production**

Acres Even Aged: 50

Natural Stand Condition: **Understory Reinitiation/Old Growth**

Acres 2-Aged: 14

Desired Future Condition **Even aged, 2-aged mixture**

Acres Uneven Aged 0

Volume(MBF) 1946

USGS 1/4 QUAD MAP #: **PTAD1 SW**

Aerial Photo: 77

Flight# 6

Photo# 93

### **I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

Class II stream east of unit - maintain riparian buffer. Two Class III streams in unit - maintain streambank stability.

Class IV within unit.

South winds predominate - incorporate disturbance ecology principles.

Possible unstable soils on upper slopes - maintain slope stability.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat.

Upper portion of unit visible from Saginaw Bay - Meet VQO of Modification

### **II. IMPLEMENTATION ACTIVITIES**

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Southern part of unit is old growth. Central and south part of unit is understory reinitiation. Class III stream protected by buffer in northern part of unit is old landslide track originating from steep ground above unit and is understory reinitiation with high spruce component.

##### **2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the Riparian Management Area. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection.) The stream to the east is in the High Gradient Contained Process Group. Manage the area within 120 feet of the no-cut buffer to provide for windfirmness. Windthrow has been recorded in the area from SE winds.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Southeast winds predominate requiring special attention on the south sides of the V-notches. Both streams within the unit are in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch to provide for windfirmness. Windthrow has been recorded in the area from SE winds.

Class IV: Field reconnaissance has identified the potential for one or two small Class IV streams in the unit. Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Unit is in medium deer HSI value and high Marten HIS value. North facing slope below 800 feet in elevation.

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit as designed meets the TLMP Standards and Guidelines for the upper portion of the unit and should surpass them for the lower portion of the unit.

##### **4. Visuals:**

Unit as designed meets VQO of Modification

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46251 runs to the last landing. It will continue past this unit in the future. To avoid wetlands as much as possible, an 800' segment of the road is located above the upper edge of a linear muskeg, but below the steeper ground located further upslope from the muskeg. This road will be put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) Seed Tree with Reserves using cable yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow.

#### **D. UNIT DESIGN:**

Upper unit boundary is located at slope break to protect soils. Partial suspension on steep slope on south end of unit.

Unit boundary parallels wind direction providing windfirmness.

Recommend running skyline to minimize soil disturbance (BMP 13.9)

The northeast unit boundary was designed to avoid small beaver ponds.



# CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 399-13.4

Management Prescription: **Timber Production**

Acres Even Aged: 50

Natural Stand Condition: **Understory Reinitiation/Old Growth**

Acres 2-Aged: 14

Desired Future Condition **Even aged, 2-aged mixture**

Acres Uneven Aged 0

Volume(MBF) 1946

USGS 1/4 QUAD MAP #: **PTAD1 SW**

Aerial Photo: 77

Flight# 6

Photo# 93

## I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class II stream east of unit - maintain riparian buffer. Two Class III streams in unit - maintain streambank stability.

Class IV within unit.

South winds predominate - incorporate disturbance ecology principles.

Possible unstable soils on upper slopes - maintain slope stability.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat.

Upper portion of unit visible from Saginaw Bay - Meet VQO of Modification

## II. IMPLEMENTATION ACTIVITIES

### **A. ECOSYSTEMS MANAGEMENT:**

#### **1. Vegetation:**

Southern part of unit is old growth. Central and south part of unit is understory reinitiation. Class III stream protected by buffer in northern part of unit is old landslide track originating from steep ground above unit and is understory reinitiation with high spruce component.

#### **2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the Riparian Management Area. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection.) The stream to the east is in the High Gradient Contained Process Group. Manage the area within 120 feet of the no-cut buffer to provide for windfirmness. Windthrow has been recorded in the area from SE winds.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Southeast winds predominate requiring special attention on the south sides of the V-notches. Both streams within the unit are in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch to provide for windfirmness. Windthrow has been recorded in the area from SE winds.

Class IV: Field reconnaissance has identified the potential for one or two small Class IV streams in the unit. Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

#### **3. Wildlife Habitat:**

Unit is in medium deer HSI value and high Marten HIS value. North facing slope below 800 feet in elevation. Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit as designed meets the TLMP Standards and Guidelines for the upper portion of the unit and should surpass them for the lower portion of the unit.

#### **4. Visuals:**

Unit as designed meets VQO of Modification

### **B. TRANSPORTATION SYSTEM:**

Specified road 46251 runs to the last landing. It will continue past this unit in the future. To avoid wetlands as much as possible, an 800' segment of the road is located above the upper edge of a linear muskeg, but below the steeper ground located further upslope from the muskeg. This road will be put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) Seed Tree with Reserves using cable yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow.

### **D. UNIT DESIGN:**

Upper unit boundary is located at slope break to protect soils. Partial suspension on steep slope on south end of unit.

Unit boundary parallels wind direction providing windfirmness.

Recommend running skyline to minimize soil disturbance (BMP 13.9)

The northeast unit boundary was designed to avoid small beaver ponds.



VCU-UNIT.ALT 399-13.5

Management Prescription: Timber Production

Natural Stand Condition: Understory Reinitiation/Old Growth

Desired Future Condition Even aged

Acres Even Aged: 64

Acres 2-Aged: 0

Acres Uneven Aged 0

Volume(MBF) 2150.4

Aerial Photo: 77 Flight# 6 Photo# 93

USGS 1/4 QUAD MAP #: PTAD1 SW

**RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

- Class II stream east of unit - maintain riparian buffer.
- Two Class III streams in unit - maintain streambank stability.
- Class IV within unit.
- South winds predominate - incorporate disturbance ecology principles.
- Possible unstable soils on upper slopes - maintain slope stability.
- Upper portion of unit visible from Saginaw Bay - Meet VQO of Modification

**II. IMPLEMENTATION ACTIVITIES****A. ECOSYSTEMS MANAGEMENT:****1. Vegetation:**

Southern part of unit is old growth. Central and south part of unit is understory reinitiation. Class III stream protected by buffer in northern part of unit is old landslide track originating from steep ground above unit and is understory reinitiation with high spruce component.

**2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the Riparian Management Area. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection.) The stream to the east is in the High Gradient Contained Process Group. Manage the area within 120 feet of the no-cut buffer to provide for windfirmness. Windthrow has been recorded in the area from SE winds.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Southeast winds predominate requiring special attention on the south sides of the V-notches. Both streams within the unit are in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch to provide for windfirmness. Windthrow has been recorded in the area from SE winds.

Class IV: Field reconnaissance has identified the potential for one or two small Class IV streams in the unit. Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

**3. Wildlife Habitat:**

Unit is in medium deer HSI value and high Marten HIS value. North facing slope below 800 feet in elevation.

**4. Visuals:**

Unit as designed meets VQO of Modification

**B. TRANSPORTATION SYSTEM:**

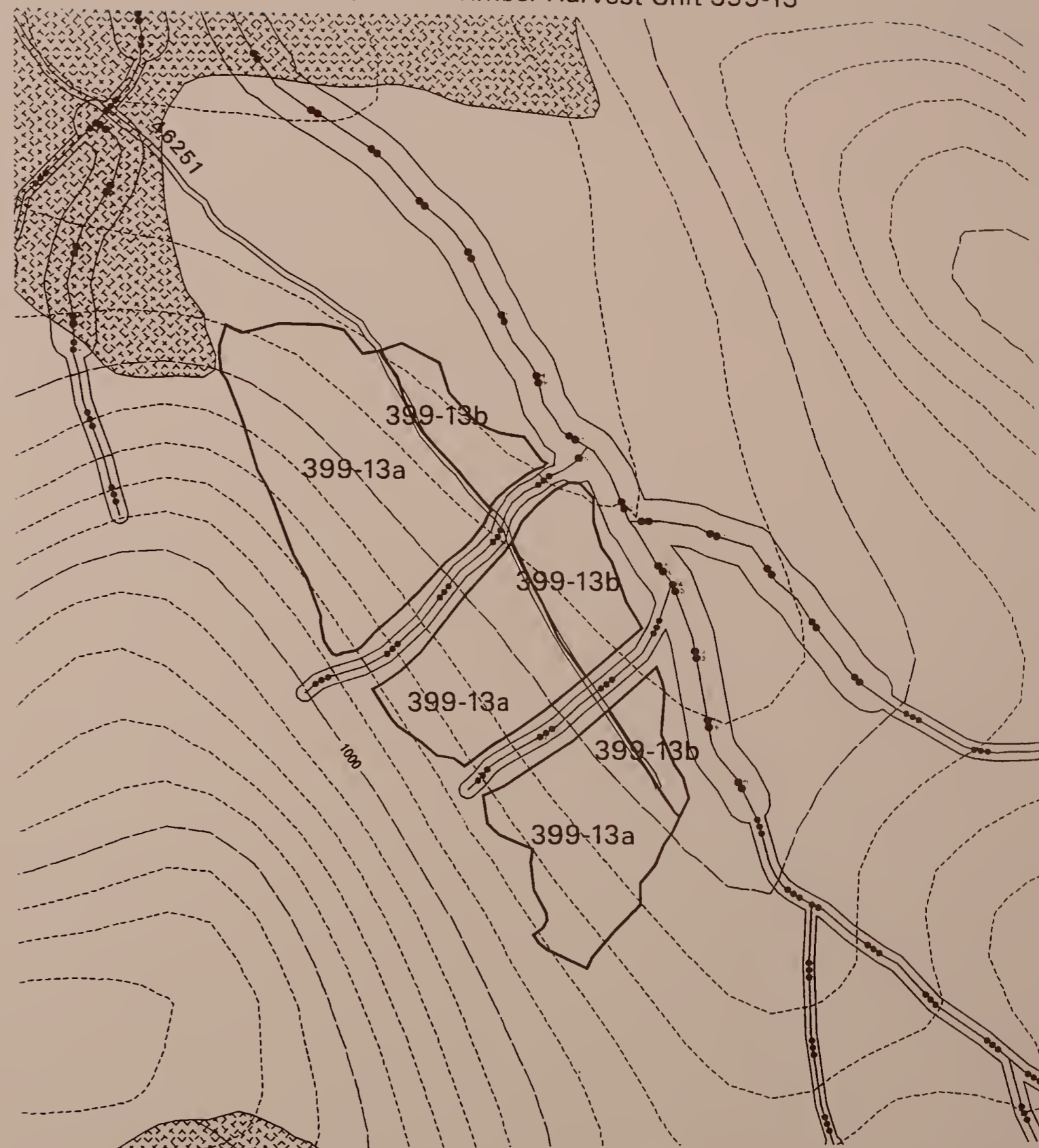
Specified road 46251 runs to the last landing. It will continue past this unit in the future. To avoid wetlands as much as possible, an 800' segment of the road is located above the upper edge of a linear muskeg, but below the steeper ground located further upslope from the muskeg. This road will be put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

**C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) is same as (a) with uphill cable yarding system.

**D. UNIT DESIGN:**

Upper unit boundary is located at slope break to protect soils.  
Partial suspension on steep slope on south end of unit.  
Unit boundary parallels wind direction providing windfirmness.  
Recommend running skyline to minimize soil disturbance (BMP 13.9)  
The northeast unit boundary was designed to avoid small beaver ponds.

**Crane/Rowan Timber Harvest Unit 399-13**

- Proposed Unit Boundaries
- Non-NF Lands
- Existing and Planned Managed Stands
- Riparian Management Area
- AHMu-Class 1 Streams
- AHMu-Class 2 Streams
- AHMu-Class 3 Streams
- AHMu-Class 4 Streams

- Existing Forest Development Roads
- Existing Closed Roads
- Proposed Forest Development Roads
- Proposed Temporary Roads
- 500-ft. Contour Interval
- 100-ft. Contour Interval

0 660 1320

Scale is 1 inch = 660 feet



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-08.2

Management Prescription: **Timber Production**

Acres Even Aged: 29

Natural Stand Condition: **Old Growth**

Acres 2-Aged: 0

Desired Future Condition **Even-aged**

Acres Uneven Aged 0

Volume(MBF) 974.4

USGS 1/4 QUAD MAP #: **PAX D1 SW**

Aerial Photo: 77

Flight# 5

Photo# 73

### **I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

Watershed exceeds 20% harvest in 30 years - conduct watershed analysis

Wildlife - Maintain corridor.

Unit is visible from saltwater - meet modification VQO.

Winds from the south predominate - incorporate disturbance ecology principles.

Class III stream along southeast portion of unit and through middle of unit - protect stream channel stability.

Possible unstable soils on upper slope in area adjacent to the SE boundary - maintain soil stability.

### **II. IMPLEMENTATION ACTIVITIES**

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Old Growth stand, stems widely spaced, with more Mtn. Hemlock than average.

##### **2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The Class III stream is in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch for windfirmness, paying special attention to the south side of the stream since south winds predominate.

##### **3. Wildlife Habitat:**

Unit is in high/medium deer HSI value and high/medium Marten HIS value. West facing slope below 800 feet in elevation.

Unit will be clearcut and will meet TLMP S&Gs for wildlife.

##### **4. Visuals:**

The landscape is viewed in the middleground distance and is part of the Security Bay viewshed. Past timber harvest dominates the east Security viewshed; where landscapes are gently rolling, with valleys and ridges interspersed through the area. Landscape in west Security and the inner lagoon area rise sharply, with steep slopes creating a dramatic landscape setting.

#### **B. TRANSPORTATION SYSTEM:**

A temporary spur will run through the upper portion of the unit and continue on into 400-9. A temporary spur crosses a wetland area of muskeg and forest mosaic. It is located to avoid the small muskeg patches to the extent possible. An ~40 ft. log stringer bridge is planned for crossing the class III stream in the unit. After harvest, the bridge and all other drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be installed as needed. All areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Even-age Clearcut using cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

#### **D. UNIT DESIGN:**

Unit is designed in conjunction with 400-21 to provide wildlife travel corridor from Security Creek to the ridge above the units.

Unit shape and location is essential to meeting visual objectives.

Steep ground to east of unit is avoided by locating boundary on class III stream.

Recommend shovel yarding in two northwest settings; running skyline in other setting.

Unit is oriented parallel to prevailing storm winds to minimize windthrow.

North boundary located along scrub timber that should be windfirm.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-08.3

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Old Growth**

Acres 2-Aged: 0

Desired Future Condition **Uneven-aged**

Acres Uneven Aged 29

Volume(MBF) 290

USGS 1/4 QUAD MAP #: **PAX D1 SW**

Aerial Photo: 77

Flight# 5

Photo# 73

### **I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

Watershed exceeds 20% harvest in 30 years - conduct watershed analysis

Wildlife - Maintain corridor.

Unit is visible from saltwater - meet modification VQO.

Winds from the south predominate - incorporate disturbance ecology principles.

Class III stream along south portion of unit - protect stream channel stability.

Possible unstable soils on upper slope in area adjacent to the SE boundary - maintain soil stability.

### **II. IMPLEMENTATION ACTIVITIES**

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Old Growth stand, stems widely spaced, with more Mtn. Hemlock than average.

##### **2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The Class III stream is in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch for windfirmness, paying special attention to the south side of the stream since south winds predominate.

##### **3. Wildlife Habitat:**

Unit is in high/medium deer HSI value and high/medium Marten HIS value. West facing slope below 800 feet in elevation.

Unit will be clearcut and will meet TLMP S&Gs for wildlife.

##### **4. Visuals:**

The landscape is viewed in the middleground distance and is part of the Security Bay viewshed. Past timber harvest dominates the east Security viewshed; where landscapes are gently rolling, with valleys and ridges interspersed through the area. Landscape in west Security and the inner lagoon area rise sharply, with steep slopes creating a dramatic landscape setting.

#### **B. TRANSPORTATION SYSTEM:**

A temporary spur will run through the upper portion of the unit and continue on into 400-9. A temporary spur crosses a wetland area of muskeg and forest mosaic. It is located to avoid the small muskeg patches to the extent possible. An ~40 ft. log stringer bridge is planned for crossing the class III stream in the unit. After harvest, the bridge and all other drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be installed as needed. All areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time it is expected that the unit will remain uneven-aged as it is sheltered from the wind.

#### **D. UNIT DESIGN:**

Unit is designed in conjunction with 400-21 to provide wildlife travel corridor from Security Creek to the ridge above the units.

Unit shape and location is essential to meeting visual objectives.

Steep ground to east of unit is avoided by locating boundary on class III stream.

Recommend shovel yarding in two northwest settings; running skyline in other setting.

Unit is oriented parallel to prevailing storm winds to minimize windthrow.

North boundary located along scrub timber that should be windfirm.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-08.4

Management Prescription: **Timber Production**

Natural Stand Condition: **Old Growth**

Desired Future Condition

Acres Even Aged: 0

Acres 2-Aged: 0

Acres Uneven Aged 0

Volume(MBF) 0

USGS 1/4 QUAD MAP #: **PAX D1 SW**

Aerial Photo: 77 Flight# 5 Photo# 73

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Watershed exceeds 20% harvest in 30 years - conduct watershed analysis  
Unit not in Alternative 4

### II. IMPLEMENTATION ACTIVITIES

#### A. ECOSYSTEMS MANAGEMENT:

1. Vegetation:

2. Aquatic Habitat:

3. Wildlife Habitat:

4. Visuals:

#### B. TRANSPORTATION SYSTEM:

#### C. SILVICULTURAL PRESCRIPTION SUMMARY:

#### D. UNIT DESIGN:



CRANE and ROWAN MOUNTAIN UNIT PLAN

VCU-UNIT.ALT 400-08.5

Management Prescription: Timber Production

Natural Stand Condition: Old Growth

Desired Future Condition

Acres Even Aged: 0

Acres 2-Aged: 0

Acres Uneven Aged 0

Volume(MBF) 0

USGS 1/4 QUAD MAP #: PAX D1 SW

Aerial Photo: 77 Flight# 5 Photo# 73

I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Watershed exceeds 20% harvest in 30 years - conduct watershed analysis  
Unit not in Alternative 5

II. IMPLEMENTATION ACTIVITIES

A. ECOSYSTEMS MANAGEMENT:

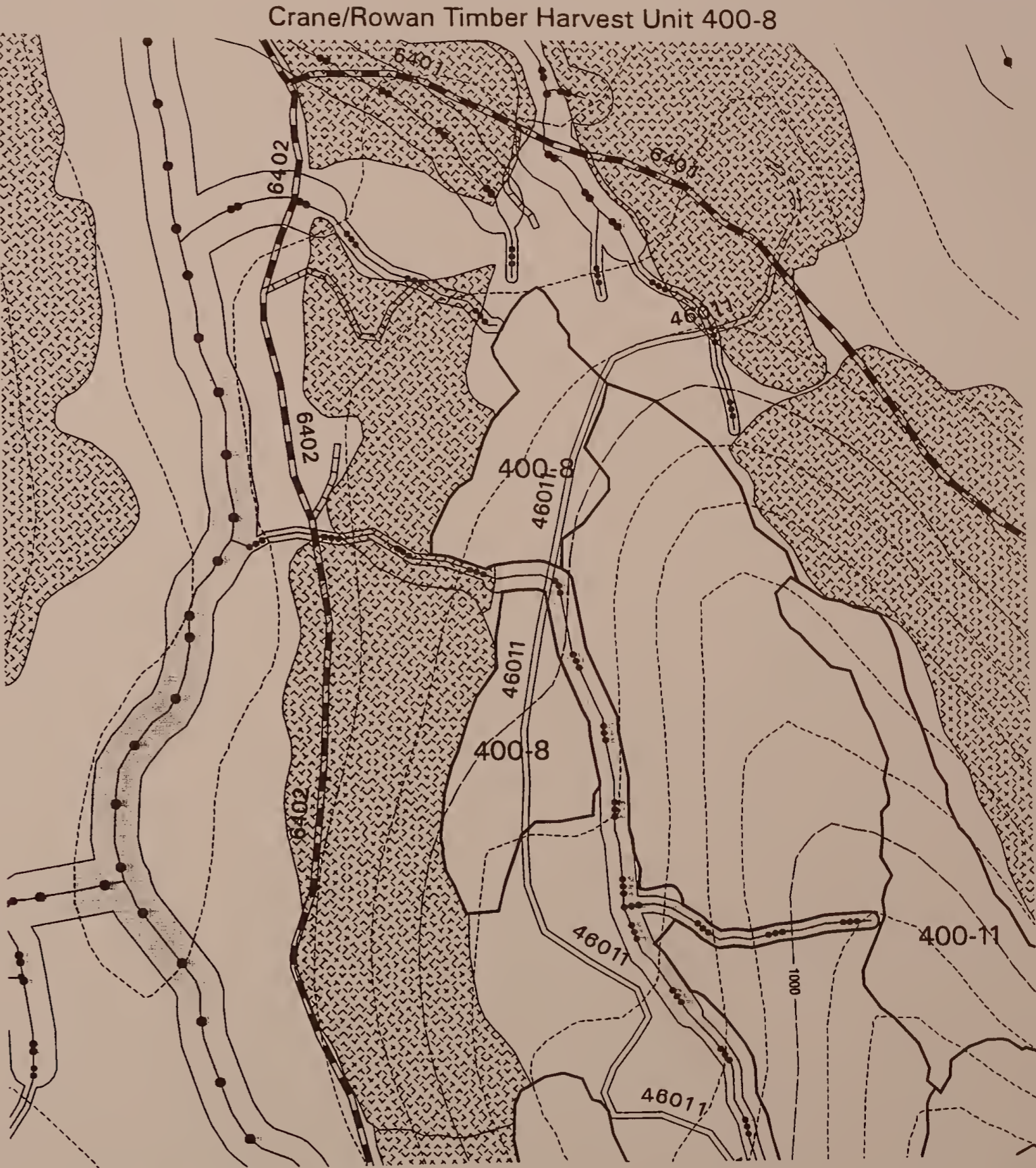
- 1. Vegetation:
- 2. Aquatic Habitat:

- 3. Wildlife Habitat:
- 4. Visuals:

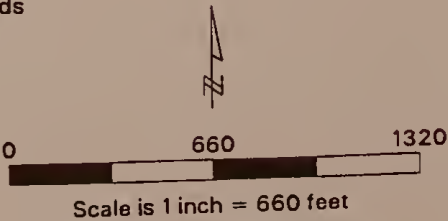
B. TRANSPORTATION SYSTEM:

C. SILVICULTURAL PRESCRIPTION SUMMARY:

D. UNIT DESIGN:



- Proposed Unit Boundaries
- Non-NF Lands
- Existing and Planned Managed Stands
- Riparian Management Area
- AHMU-Class 1 Streams
- AHMU-Class 2 Streams
- AHMU-Class 3 Streams
- AHMU-Class 4 Streams
- Existing Forest Development Roads
- Existing Closed Roads
- Proposed Forest Development Roads
- Proposed Temporary Roads
- 500-ft. Contour Interval
- 100-ft. Contour Interval





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-09.2

Management Prescription: **Timber Production**

Acres Even Aged: 33

Natural Stand Condition: **Old Growth**

Acres 2-Aged: 0

Desired Future Condition **Even-aged**

Acres Uneven Aged 0

Volume(MBF) 1108.8

USGS 1/4 QUAD MAP #: **PTA D1 SW**

Aerial Photo: 77 Flight# 5 Photo# 72

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Watershed exceeds 20% harvest in 30 years - conduct watershed analysis  
Class III stream east of unit - maintain stream channel.  
Winds from the South predominate - incorporate disturbance ecology principles.  
Unit is visible from saltwater - meet modification VQO.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is Old Growth with no apparent cohorts, average site.

##### **2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream along the eastern boundary is in the High Gradient Contained Process Group. Manage the area 120 feet beyond the V-notch for windfirmness. The buffer may be susceptible to SW winds.

##### **3. Wildlife Habitat:**

Unit is in high/medium deer HSI value and high Marten HIS value. West facing slope below 800 feet in elevation.

##### **4. Visuals:**

The landscape is viewed in the middleground distance and is part of the Security Bay viewshed. Past timber harvest dominates the east Security viewshed; where landscapes are gently rolling, with valleys and ridges interspersed through the area. Landscape in west Security and the inner lagoon area rise sharply, with steep slopes creating a dramatic landscape setting.

#### **B. TRANSPORTATION SYSTEM:**

The temporary spur continuing on from 400-8 ends at the landing for the cable setting at the north end of 400-9. The southern setting will be yarded by helicopter to avoid ~500 ft. of full bench road that would be needed to access a cable landing. All drainage structures will be removed from the temporary spur to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Evenage Clearcut using cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

#### **D. UNIT DESIGN:**

Use class III stream east of unit as boundary.  
Northern boundary is along windfirm scrub muskeg and an existing harvest unit.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-09.3

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Old Growth**

Acres 2-Aged: 33

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 627

USGS 1/4 QUAD MAP #: **PTAD1 SW**

Aerial Photo: 77

Flight# 5

Photo#

72

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Watershed exceeds 20% harvest in 30 years - conduct watershed analysis

Class III stream east of unit - maintain stream channel.

Winds from the South predominate - incorporate disturbance ecology principles.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

Unit is visible from saltwater - meet modification VQO.

### II. IMPLEMENTATION ACTIVITIES

#### A. ECOSYSTEMS MANAGEMENT:

##### 1. Vegetation:

Stand is Old Growth with no apparent cohorts, average site.

##### 2. Aquatic Habitat:

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream along the eastern boundary is in the High Gradient Contained Process Group. Manage the area 120 feet beyond the V-notch for windfirmness. The buffer may be susceptible to SW winds.

##### 3. Wildlife Habitat:

Unit is in high/medium deer HSI value and high Marten HIS value.

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### 4. Visuals:

The landscape is viewed in the middleground distance and is part of the Security Bay viewshed. Past timber harvest dominates the east Security viewshed; where landscapes are gently rolling, with valleys and ridges interspersed through the area. Landscape in west Security and the inner lagoon area rise sharply, with steep slopes creating a dramatic landscape setting. Unit as designed with 2-aged prescription achieves partial retention VQO.

#### B. TRANSPORTATION SYSTEM:

The temporary spur continuing on from 400-8 ends at the landing for the cable setting at the north end of 400-9. The southern setting will be yarded by helicopter to avoid ~500 ft. of full bench road that would be needed to access a cable landing. All drainage structures will be removed from the temporary spur to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### C. SILVICULTURAL PRESCRIPTION SUMMARY:

2-Aged Seedtree with reserves (upper and lower diameter limit Rx for hemlock and cedar, paint for reserve 1 large spruce every 10 acres) using cable and helicopter yarding systems, certify natural regeneration, pre-commercial thin to maintain healthy stand. Initial managed stand will have 3 cohorts; 1) Young component from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. With moderate to high wind disturbance potential, it is expected that over time the unit will become 2-aged through senescence of larger diameter trees by wind snap.

#### D. UNIT DESIGN:

Use class III stream east of unit as boundary.

Northern boundary is along windfirm scrub muskeg and an existing harvest unit.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-09.4

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Old Growth**

Acres 2-Aged: 33

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 627

USGS 1/4 QUAD MAP #: **PTA D1 SW**

Aerial Photo: 77

Flight# 5

Photo#

72

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

See unit card 400-22.4 for combined unit card.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

Unit is visible from saltwater - meet modification VQO.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is Old Growth with no apparent cohorts, average site.

##### **2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream along the eastern boundary is in the High Gradient Contained Process Group. Manage the area 120 feet beyond the V-notch for windfirmness. The buffer may be susceptible to SW winds.

##### **3. Wildlife Habitat:**

Unit is in high/medium deer HSI value and high Marten HIS value.

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

The landscape is viewed in the middleground distance and is part of the Security Bay viewshed. Past timber harvest dominates the east Security viewshed; where landscapes are gently rolling, with valleys and ridges interspersed through the area. Landscape in west Security and the inner lagoon area rise sharply, with steep slopes creating a dramatic landscape setting.

Unit as designed with 2-aged prescription achieves partial retention VQO.

#### **B. TRANSPORTATION SYSTEM:**

With unit 400-8 not included in this alternative, it is more economical to helicopter yard 400-9 than build 0.9 miles of temporary spur to access one 5-acre cable setting. Use helicopter landing on existing road 6402. No new roads needed.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and plant 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

Use class III stream east of unit as boundary.

Northern boundary is along windfirm scrub muskeg and an existing harvest unit.



**VCU-UNIT.ALT 400-11.5**  
Management Prescription: **Timber Production**  
Natural Stand Condition: **Old growth**  
Desired Future Condition

Acres Even Aged: 0  
Acres 2-Aged: 0  
Acres Uneven Aged 0  
Volume(MBF) 0

USGS 1/4 QUAD MAP #: **PTAD1 SW** Aerial Photo: 77 Flight# 5 Photo# 72

**RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

Watershed exceeds 20% harvest in 30 years - conduct watershed analysis  
Unit not included in alternative 5  
No streams in unit.

**IMPLEMENTATION ACTIVITIES**

**A. ECOSYSTEMS MANAGEMENT:**

1. **Vegetation:**  
oldgrowth
2. **Aquatic Habitat:**  
No Class I/II streams in Unit.  
No Class III streams in Unit.

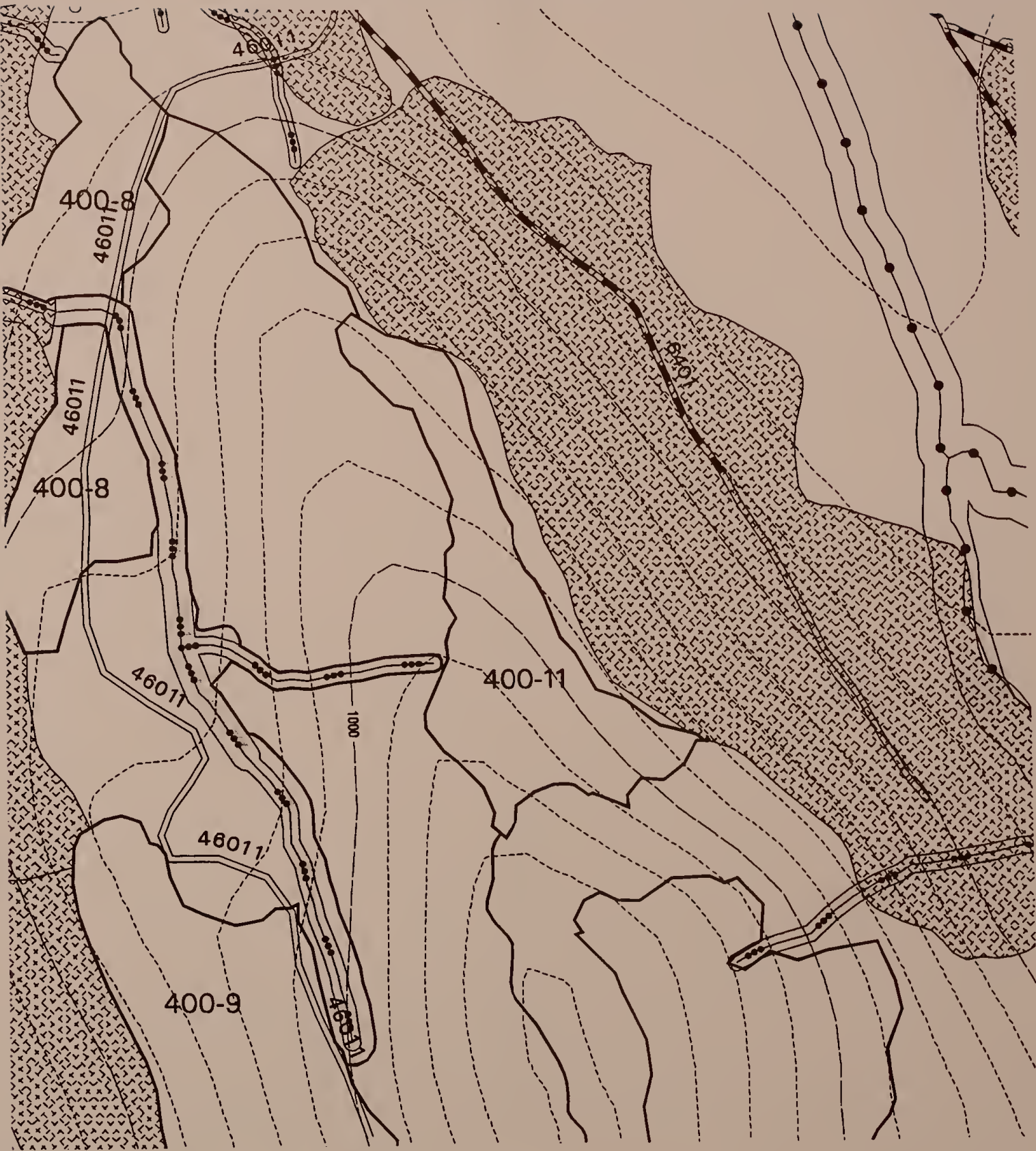
3. **Wildlife Habitat:**
4. **Visuals:**

**B. TRANSPORTATION SYSTEM:**

**C. SILVICULTURAL PRESCRIPTION SUMMARY:**

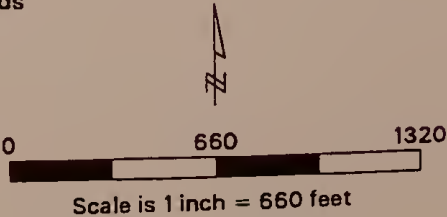
**D. UNIT DESIGN:**

Crane/Rowan Timber Harvest Unit 400-11



- Proposed Unit Boundaries
- Non-NF Lands
- Existing and Planned Managed Stands
- Riparian Management Area
- AHMU-Class 1 Streams
- AHMU-Class 2 Streams
- AHMU-Class 3 Streams
- AHMU-Class 4 Streams

- Existing Forest Development Roads
- Existing Closed Roads
- Proposed Forest Development Roads
- Proposed Temporary Roads
- 500-ft. Contour Interval
- 100-ft. Contour Interval





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-11.2

Management Prescription: **Timber Production**

Acres Even Aged: 26

Natural Stand Condition: **Old growth**

Acres 2-Aged: 0

Desired Future Condition **Even aged**

Acres Uneven Aged 0

Volume(MBF) 873.6

USGS 1/4 QUAD MAP #: **PTAD1 SW**

Aerial Photo: 77

Flight# 5

Photo# 72

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Watershed exceeds 20% harvest in 30 years - conduct watershed analysis

Unit is visible from saltwater - meet modification VQO.

Access "difficult" component of the ASQ - develop techniques for managing this component.

Unit is in high probability wind zone - incorporate disturbance ecology principles.

No streams in unit.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

oldgrowth

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

No Class III streams in Unit.

##### **3. Wildlife Habitat:**

Unit is in medium deer HSI value and high Marten HIS value. North facing slope below 1200 feet in elevation.

##### **4. Visuals:**

The landscape is viewed in the middleground distance and is part of the Security Bay viewshed. Past timberharvest dominates the east Security viewshed; where landscapes are gently rolling. The inner lagoon area and west Security are pristine in character, where the landscapes rise sharply, with steep slopes creating a dramatic landscape setting.

#### **B. TRANSPORTATION SYSTEM:**

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing on existing road 6401. No new roads needed.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Clearcut for natural regeneration, use helicopter yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs.

#### **D. UNIT DESIGN:**

Unit is planned for helicopter yarding, as it is isolated above the backline of an old harvest unit and is not accessible by road due to steep topography.

Unit boundaries are parallel to southeast winds and due to oblique viewing angle will meet the visual objective.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-11.3

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Old Growth**

Acres 2-Aged: 0

Desired Future Condition **Uneven aged**

Acres Uneven Aged 26

Volume(MBF) 260

USGS 1/4 QUAD MAP #: **PTAD1 SW**

Aerial Photo: 77

Flight# 5

Photo# 72

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Watershed exceeds 20% harvest in 30 years - conduct watershed analysis

Unit is visible from saltwater - meet modification VQO.

Access "difficult" component of the ASQ - develop techniques for managing this component.

Unit is in Low probability wind zone - incorporate disturbance ecology principles

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

No streams in unit.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

oldgrowth

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

No Class III streams in Unit.

##### **3. Wildlife Habitat:**

Unit is in medium deer HSI value and high Marten HIS value. North facing slope below 1200 feet in elevation.

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

The landscape is viewed in the middleground distance and is part of the Security Bay viewshed. Past timberharvest dominates the east Security viewshed; where landscapes are gently rolling. The inner lagoon area and west Security are pristine in character, where the landscapes rise sharply, with steep slopes creating a dramatic landscape setting.

#### **B. TRANSPORTATION SYSTEM:**

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing on existing road 6401. No new roads needed.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and plant 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

Unit is planned for helicopter yarding, as it is isolated above the backline of an old harvest unit and is not accessible by road due to steep topography.

Unit boundaries are parallel to southeast winds and due to oblique viewing angle will meet the visual objective.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-11.4

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Old growth**

Acres 2-Aged: 26

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 494

USGS 1/4 QUAD MAP #: **PTAD1 SW**

Aerial Photo: 77

Flight# 5

Photo# 72

### **I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

See unit card 400-22.4 for combination unit.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

No streams in unit.

### **II. IMPLEMENTATION ACTIVITIES**

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

oldgrowth

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

No Class III streams in Unit.

##### **3. Wildlife Habitat:**

Unit is in medium deer HSI value and high Marten HIS value. North facing slope below 1200 feet in elevation.

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

The landscape is viewed in the middleground distance and is part of the Security Bay viewshed. Past timberharvest dominates the east Security viewshed; where landscapes are gently rolling. The inner lagoon area and west Security are pristine in character, where the landscapes rise sharply, with steep slopes creating a dramatic landscape setting.

#### **B. TRANSPORTATION SYSTEM:**

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing on existing road 6401. No new roads needed.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and plant 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

Unit is planned for helicopter yarding, as it is isolated above the backline of an old harvest unit and is not accessible by road due to steep topography.

Unit boundaries are parallel to southeast winds and due to oblique viewing angle will meet the visual objective.



**VCU-UNIT.ALT 400-12.5**

Acres Even Aged: 0

Management Prescription: Timber Production

Acres 2-Aged: 0

Natural Stand Condition: Understory Reinitiation/Old Growth

Acres Uneven Aged 0

Desired Future Condition

Volume(MBF) 0

USGS 1/4 QUAD MAP #: PTAD1 SW

Aerial Photo: 77 Flight# 5 Photo# 71

**I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

- Watershed exceeds 20% harvest in 30 years - conduct watershed analysis
- Unit not included in alternative 5
- Two class III streams along unit boundary - maintain stream channel stability.

**II. IMPLEMENTATION ACTIVITIES**

**A. ECOSYSTEMS MANAGEMENT:**

- 1. Vegetation:
- 2. Aquatic Habitat:

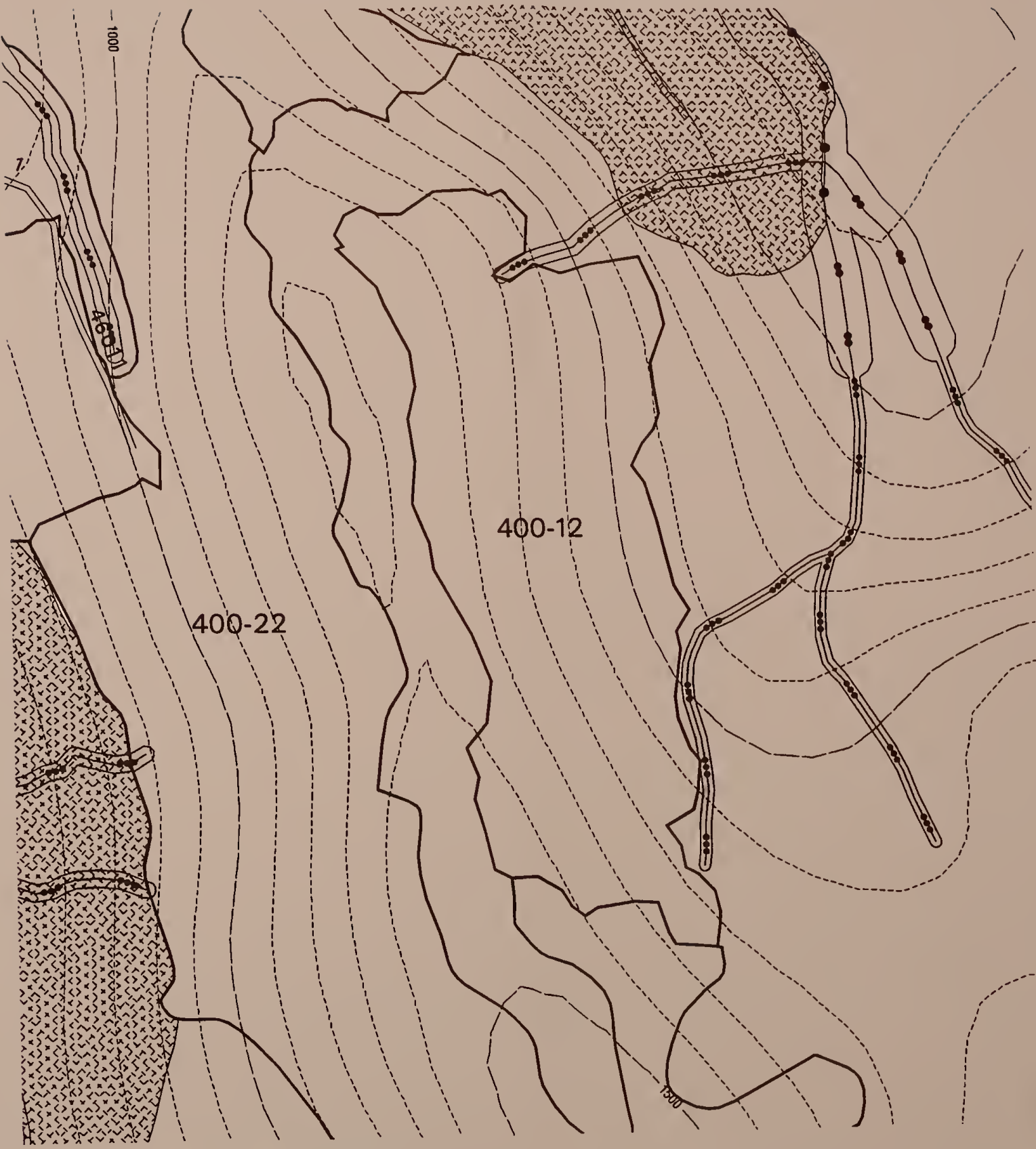
- 3. Wildlife Habitat:
- 4. Visuals:

**B. TRANSPORTATION SYSTEM:**

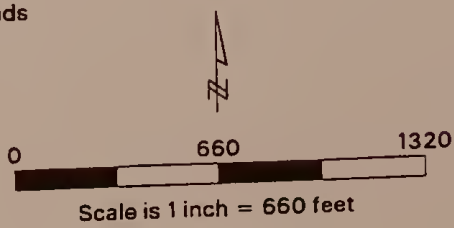
**C. SILVICULTURAL PRESCRIPTION SUMMARY:**

**D. UNIT DESIGN:**

Crane/Rowan Timber Harvest Unit 400-12



- |  |                                     |  |                                   |
|--|-------------------------------------|--|-----------------------------------|
|  | Proposed Unit Boundaries            |  | Existing Forest Development Roads |
|  | Non-NF Lands                        |  | Existing Closed Roads             |
|  | Existing and Planned Managed Stands |  | Proposed Forest Development Roads |
|  | Riparian Management Area            |  | Proposed Temporary Roads          |
|  | AHMu-Class 1 Streams                |  | 500-ft. Contour Interval          |
|  | AHMu-Class 2 Streams                |  | 100-ft. Contour Interval          |
|  | AHMu-Class 3 Streams                |  |                                   |
|  | AHMu-Class 4 Streams                |  |                                   |





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-12.2

Management Prescription: **Timber Production**

Acres Even Aged: 79

Natural Stand Condition: **Understory Reinitiation/Old Growth**

Acres 2-Aged: 0

Desired Future Condition **Even-aged**

Acres Uneven Aged 0

Volume(MBF) 2654.4

USGS 1/4 QUAD MAP #: **PTAD1 SW**

Aerial Photo: 77 Flight# 5 Photo# 71

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Watershed exceeds 20% harvest in 30 years - conduct watershed analysis  
Access "difficult" component of the ASQ - develop techniques for managing this component.  
Winds from the southeast predominate - incorporate disturbance ecology principles.  
Two class III streams along unit boundary - maintain stream channel stability.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Top of unit is Understory Reinitiation with many stilt rooted spruce. Lower portion is Old Growth with no apparent cohorts. Managed stand will be even-aged.

##### **2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Both Class III streams along the unit are in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch to provide for windfirmness. Windthrow has been recorded in the area from SE winds.

A Class IV stream may extend into the unit from the Class III at the north end of the unit. Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream.( BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Unit is in medium/low deer HSI value and high/medium Marten HIS value. North facing slope above 1200 feet in elevation.

##### **4. Visuals:**

#### **B. TRANSPORTATION SYSTEM:**

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing on existing road 6401. No new roads needed.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Clearcut for natural regeneration, use helicopter yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs.

#### **D. UNIT DESIGN:**

Unit is planned for helicopter yarding. Unit is isolated above the backline of an old harvest unit and is not accessible by road due to steep topography.

Unit is oriented parallel to southeast winds. North boundary is located on a topographic break to minimize windthrow.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-12.3

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation/Old Growth**

Acres 2-Aged: 39

Desired Future Condition **2-aged / Uneven-Aged**

Acres Uneven Aged 40

Volume(MBF) 1141

USGS 1/4 QUAD MAP #: **PTAD1 SW**

Aerial Photo: 77

Flight# 5

Photo# 71

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Watershed exceeds 20% harvest in 30 years - conduct watershed analysis  
Access "difficult" component of the ASQ - develop techniques for managing this component.  
Unit is in Moderate probability wind zone - incorporate disturbance ecology principles.  
Two class III streams along unit boundary - maintain stream channel stability.  
Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Top of unit is Understory Reinitiation with many stilt rooted spruce. Lower portion is Old Growth with no apparent cohorts.

##### **2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Both Class III streams along the unit are in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch to provide for windfirmness. Windthrow has been recorded in the area from SE winds.

Class IV stream may extend into the unit from the Class III at the north end of the unit. Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Unit is in medium/low deer HSI value and high/medium Marten HIS value. North facing slope above 1200 feet in elevation. Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

#### **B. TRANSPORTATION SYSTEM:**

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing on existing road 6401. No new roads needed.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Wind disturbance over time will return upper part of unit to 2-aged through senescence of larger diameter trees by wind snap. Lower part of unit will remain uneven-aged as it is more sheltered from the wind.

#### **D. UNIT DESIGN:**

Unit is planned for helicopter yarding. Unit is isolated above the backline of an old harvest unit and is not accessible by road due to steep topography.

Unit is oriented parallel to southeast winds. North boundary is located on a topographic break to minimize windthrow.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-12.4

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation / Old Growth**

Acres 2-Aged: 39

Desired Future Condition **2-aged / Uneven-Aged**

Acres Uneven Aged 40

Volume(MBF) 1141

USGS 1/4 QUAD MAP #: **PTAD1 SW**

Aerial Photo: 77

Flight# 5

Photo# 71

### **I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

See unit card 400-22.4 for combination unit

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

Two class III streams along unit boundary - maintain stream channel stability.

### **II. IMPLEMENTATION ACTIVITIES**

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Top of unit is Understory Reinitiation with many stilt rooted spruce. Lower portion is Old Growth with no apparent cohorts.

##### **2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Both Class III streams along the unit are in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch to provide for windfirmness. Windthrow has been recorded in the area from SE winds.

Class IV stream may extend into the unit from the Class III at the north end of the unit. Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream.( BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Unit is in medium/low deer HSI value and high/medium Marten HIS value. North facing slope above 1200 feet in elevation. Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

#### **B. TRANSPORTATION SYSTEM:**

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing on existing road 6401. No new roads needed.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Wind disturbance over time will return upper part of unit to 2-aged through senescence of larger diameter trees by wind snap. Lower part of unit will remain uneven-aged as it is more sheltered from the wind.

#### **D. UNIT DESIGN:**

Unit is planned for helicopter yarding. Unit is isolated above the backline of an old harvest unit and is not accessible by road due to steep topography.

Unit is oriented parallel to southeast winds. North boundary is located on a topographic break to minimize windthrow.



CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT 400-18.5**

Acres Even Aged: 59

Management Prescription: Timber Production

Acres 2-Aged: 0

Natural Stand Condition: Understory Reinitiation

Acres Uneven Aged 0

Desired Future Condition Even aged

Volume(MBF) 1982.4

USGS 1/4 QUAD MAP #: PTAD1 SW

Aerial Photo: 77 Flight# 4 Photo# 26

**I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

Access "difficult" component of the ASQ - develop techniques for managing this component.  
Class III stream west of unit - maintain stream channel stability.  
Unit is visible from saltwater - VQO is modification.

**II. IMPLEMENTATION ACTIVITIES**

**A. ECOSYSTEMS MANAGEMENT:**

**1. Vegetation:**

Manage as even-aged stand, clear-cut for natural regeneration, certify natural regeneration, pre-commercial thin to maintain healthy stand.

**2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Class III stream to the west is in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch for windfirmness. Even aged windthrow stand nearby appears to have been from SW winds.

**3. Wildlife Habitat:**

Unit is in medium deer HSI value and high Marten HIS value. West facing slope below 1100 feet in elevation.

**4. Visuals:**

This landscape is viewed in the middleground distance from outside Security and Saginaw Bays. Past timber harvest dominates areas seen from these bays.  
Unit meets modification VQO as designed.

**B. TRANSPORTATION SYSTEM:**

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing on existing road 6425. No new roads needed.

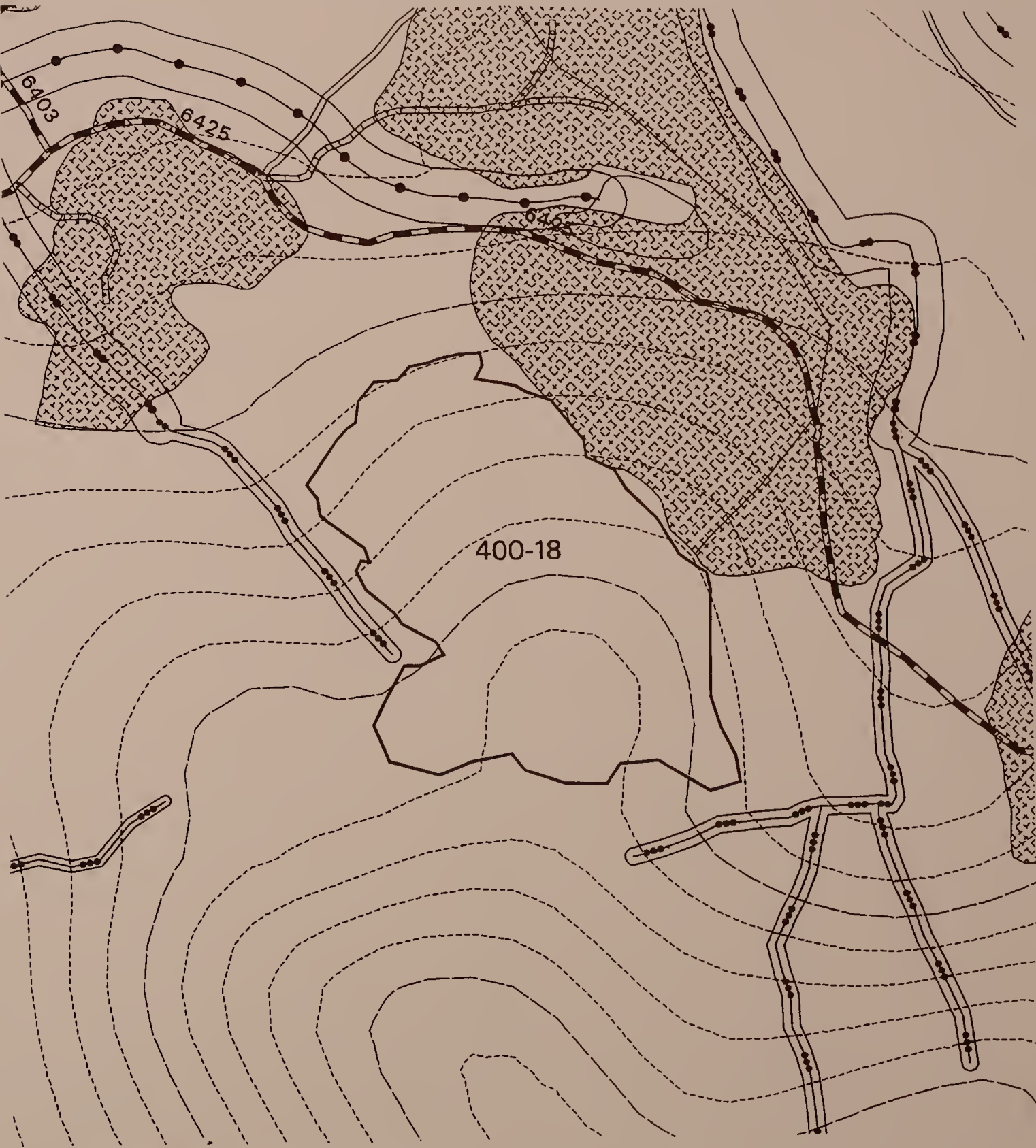
**C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Clearcut for natural regeneration, use helicopter yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs.

**D. UNIT DESIGN:**

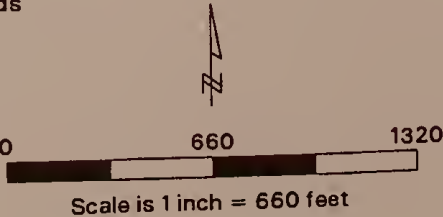
Unit is planned for helicopter yarding, as it is isolated above the backline of an old harvest unit and is not accessible by road due to steep topography.  
Northwest portion of the unit adjacent to an old windthrow area. Northeast area is adjacent to older existing harvest unit.

Crane/Rowan Timber Harvest Unit 400-18



- Proposed Unit Boundaries
- Non-NF Lands
- Existing and Planned Managed Stands
- Riparian Management Area
- AHMU-Class 1 Streams
- AHMU-Class 2 Streams
- AHMU-Class 3 Streams
- AHMU-Class 4 Streams

- Existing Forest Development Roads
- Existing Closed Roads
- Proposed Forest Development Roads
- Proposed Temporary Roads
- 500-ft. Contour Interval
- 100-ft. Contour Interval





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-18.2

Management Prescription: **Timber Production**

Acres Even Aged: 59

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 0

Desired Future Condition **Even aged**

Acres Uneven Aged 0

Volume(MBF) 1982.4

USGS 1/4 QUAD MAP #: **PTAD1 SW**

Aerial Photo: 77 Flight# 4 Photo# 26

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Access "difficult" component of the ASQ - develop techniques for managing this component.  
Class III stream west of unit - maintain stream channel stability.  
Unit is visible from saltwater - VQO is modification.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Manage as even-aged stand, clear-cut for natural regeneration, certify natural regeneration, pre-commercial thin to maintain healthy stand.

##### **2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Class III stream to the west is in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch for windfirmness. Even aged windthrow stand nearby appears to have been from SW winds.

##### **3. Wildlife Habitat:**

Unit is in medium deer HSI value and high Marten HIS value. West facing slope below 1100 feet in elevation.

##### **4. Visuals:**

This landscape is viewed in the middleground distance from outside Security and Saginaw Bays. Past timber harvest dominates areas seen from these bays.  
Unit meets modification VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing on existing road 6425. No new roads needed.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Clearcut for natural regeneration, use helicopter yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs.

#### **D. UNIT DESIGN:**

Unit is planned for helicopter yarding, as it is isolated above the backline of an old harvest unit and is not accessible by road due to steep topography.

Northwest portion of the unit adjacent to an old windthrow area. Northeast area is adjacent to older existing harvest unit.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-18.3

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 59

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 1121

USGS 1/4 QUAD MAP #: **PTAD1 SW**

Aerial Photo: 77

Flight# 4

Photo# 26

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Access "difficult" component of the ASQ - develop techniques for managing this component.

Class III stream west of unit - maintain stream channel stability.

Unit is visible from saltwater - VQO is modification.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Maintain a heterogeneous multicohort stand structure. Managed stand will have 3 cohorts; 1) Young component from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value.

##### **2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Class III stream to the west is in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch for windfirmness. Even aged windthrow stand nearby appears to have been from SW winds.

##### **3. Wildlife Habitat:**

Unit is in medium deer HSI value and high Marten HIS value. West facing slope below 1100 feet in elevation.

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species.

Entire unit will be harvested using an alternative silvicultural prescription (See below). This should exceed the TLMP Standards and Guidelines for the entire the unit.

##### **4. Visuals:**

This landscape is viewed in the middleground distance from outside Security and Saginaw Bays. Past timber harvest dominates areas seen from these bays.

Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing on existing road 6425. No new roads needed.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and plant 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

Unit is planned for helicopter yarding, as it is isolated above the backline of an old harvest unit and is not accessible by road due to steep topography.

Northwest portion of the unit adjacent to an old windthrow area. Northeast area is adjacent to older existing harvest unit.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-18.4

Acres Even Aged: 0

Management Prescription: **Timber Production**

Acres 2-Aged: 59

Natural Stand Condition: **Understory Reinitiation**

Acres Uneven Aged 0

Desired Future Condition **2-aged**

Volume(MBF) 1121

USGS 1/4 QUAD MAP #: **PTAD1 SW**

Aerial Photo: 77

Flight# 4

Photo# 26

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Access "difficult" component of the ASQ - develop techniques for managing this component.

Class III stream west of unit - maintain stream channel stability.

Unit is visible from saltwater - VQO is modification.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Maintain a heterogeneous multicohort stand structure. Managed stand will have 3 cohorts; 1) Young component from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value.

##### **2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Class III stream to the west is in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch for windfirmness. Even aged windthrow stand nearby appears to have been from SW winds.

##### **3. Wildlife Habitat:**

Unit is in medium deer HSI value and high Marten HIS value. West facing slope below 1100 feet in elevation. Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Entire unit will be harvested using an alternative silvicultural prescription (See below). This should exceed the TLMP Standards and Guidelines for the entire the unit.

##### **4. Visuals:**

This landscape is viewed in the middleground distance from outside Security and Saginaw Bays. Past timber harvest dominates areas seen from these bays. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing on existing road 6425. No new roads needed.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

Unit is planned for helicopter yarding, as it is isolated above the backline of an old harvest unit and is not accessible by road due to steep topography.

Northwest portion of the unit adjacent to an old windthrow area. Northeast area is adjacent to older existing harvest unit.



CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT 400-22.5**  
Management Prescription: Timber Production  
Natural Stand Condition:  
Desired Future Condition:

Acres Even Aged: 0  
Acres 2-Aged: 0  
Acres Uneven Aged: 0  
Volume(MBF) 0  
Aerial Photo: 0 Flight# Photo# 0

USGS 1/4 QUAD MAP #:

**RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

Unit not in alternative 5

**II. IMPLEMENTATION ACTIVITIES**

**A. ECOSYSTEMS MANAGEMENT:**

- 1. Vegetation:
- 2. Aquatic Habitat:

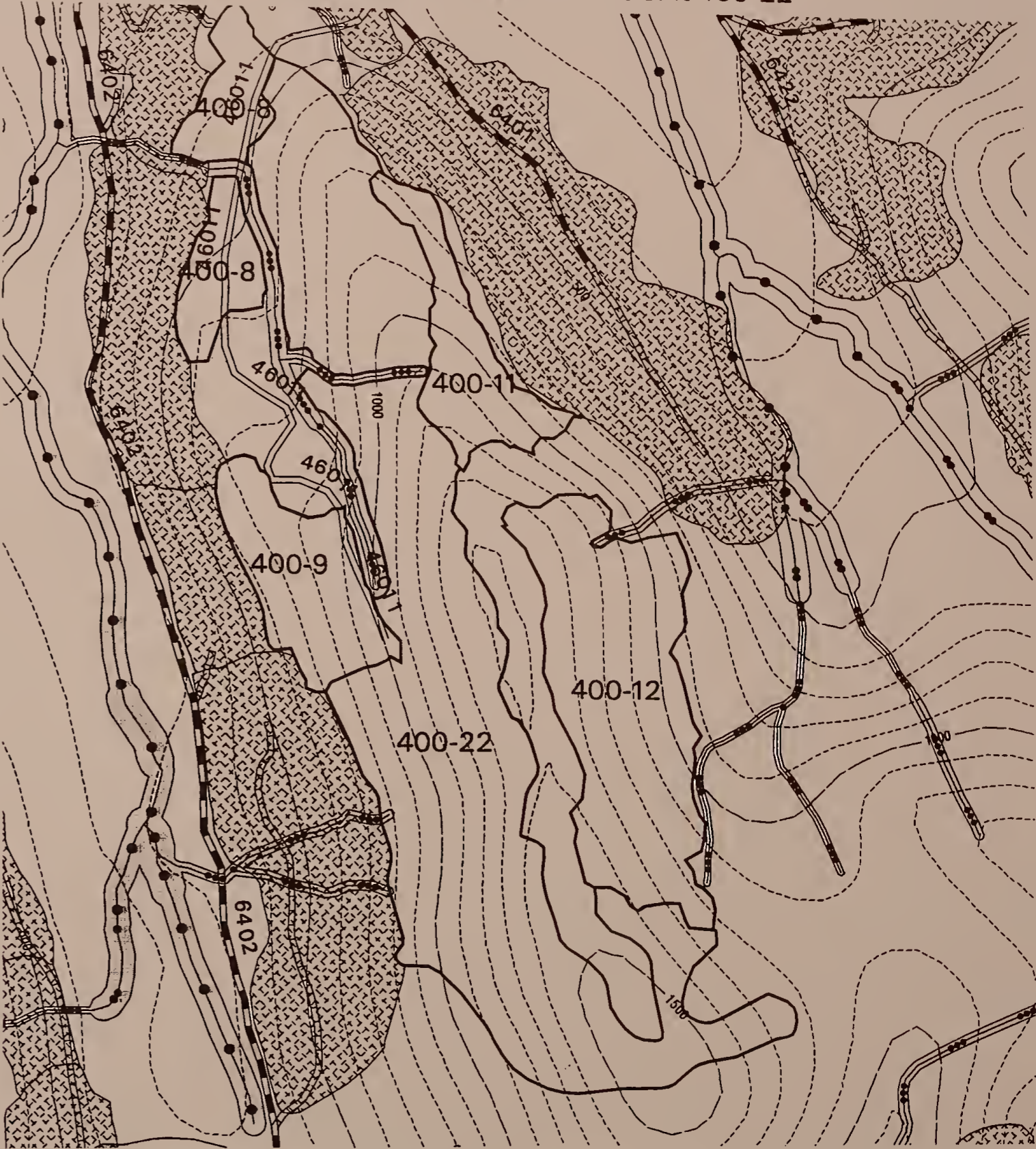
- 3. Wildlife Habitat:
- 4. Visuals:

**B. TRANSPORTATION SYSTEM:**

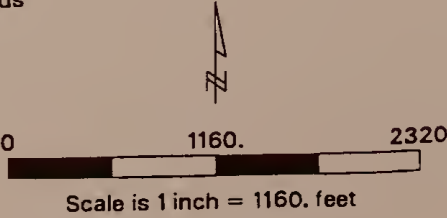
**C. SILVICULTURAL PRESCRIPTION SUMMARY:**

**D. UNIT DESIGN:**

Crane/Rowan Timber Harvest Unit 400-22



- |  |                                     |  |                                   |
|--|-------------------------------------|--|-----------------------------------|
|  | Proposed Unit Boundaries            |  | Existing Forest Development Roads |
|  | Non-NF Lands                        |  | Existing Closed Roads             |
|  | Existing and Planned Managed Stands |  | Proposed Forest Development Roads |
|  | Riparian Management Area            |  | Proposed Temporary Roads          |
|  | AHMU-Class 1 Streams                |  | 500-ft. Contour Interval          |
|  | AHMU-Class 2 Streams                |  | 100-ft. Contour Interval          |
|  | AHMU-Class 3 Streams                |  |                                   |
|  | AHMU-Class 4 Streams                |  |                                   |





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-22.2

Management Prescription: **Timber Production**

Natural Stand Condition:

Desired Future Condition

Acres Even Aged:

Acres 2-Aged: 0

Acres Uneven Aged

Volume(MBF)

USGS 1/4 QUAD MAP #:

Aerial Photo: 0

Flight#

Photo#

0

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit not in alternative 2

### II. IMPLEMENTATION ACTIVITIES

#### A. ECOSYSTEMS MANAGEMENT:

1. Vegetation:

2. Aquatic Habitat:

3. Wildlife Habitat:

4. Visuals:

#### B. TRANSPORTATION SYSTEM:

#### C. SILVICULTURAL PRESCRIPTION SUMMARY:

#### D. UNIT DESIGN:



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-22.3

Management Prescription: **Timber Production**

Natural Stand Condition:

Desired Future Condition

Acres Even Aged: 0

Acres 2-Aged: 0

Acres Uneven Aged 0

Volume(MBF) 0

USGS 1/4 QUAD MAP #:

Aerial Photo: 0

Flight#

Photo#

0

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit not in alternative 3

### II. IMPLEMENTATION ACTIVITIES

#### A. ECOSYSTEMS MANAGEMENT:

1. Vegetation:

2. Aquatic Habitat:

3. Wildlife Habitat:

4. Visuals:

#### B. TRANSPORTATION SYSTEM:

#### C. SILVICULTURAL PRESCRIPTION SUMMARY:

#### D. UNIT DESIGN:



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 400-22.4

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 288

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 5472

USGS 1/4 QUAD MAP #:

Aerial Photo: 0

Flight# 0

Photo# 0

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Watershed exceeds 20% harvest in 30 years - conduct watershed analysis

This unit combines units 400- 9, 11, 12, & 22 into one 2-aged unit (366 acres). All will be harvested using 2-aged seed tree with reserve silvicultural prescription (See below).

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

Several Class III streams in unit.

Class IV streams may be encountered during layout.

Unit is visible from saltwater - meet modification VQO.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand wraps around top of hill. Is largely understory reinitiation with small patches of old growth.

##### **2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Class III streams within the unit are in the High Gradient Contained Process Group. Manage the area within 120 feet for windfirmness. Southeast winds predominate.

If Class IV streams are encountered during layout, provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit 400-8 will be clearcut and will meet the TLMP Standards and Guidelines. The rest of the unit will be harvested using an alternative silvicultural prescription. This should exceed the TLMP Standards and Guidelines for this portion of the unit.

##### **4. Visuals:**

The landscape is viewed in the middleground distance and is part of the Security Bay viewshed. Past timber harvest dominates the east Security viewshed; where landscapes are gently rolling, with valleys and ridges interspersed through the area. Landscape in west Security and the inner lagoon area rise sharply, with steep slopes creating a dramatic landscape setting. Unit as designed with 2-aged prescription achieves partial retention VQO.

#### **B. TRANSPORTATION SYSTEM:**

Most of the unit is inaccessible by road due to steep topography. Planned helicopter unit will use landing on existing road 6402. No new roads needed.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and plant 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young component from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Wind disturbance over time will return parts of unit to 2-aged through removal of larger diameter trees by wind snap. Old growth parts of unit will remain uneven-aged as they are more sheltered from the wind.

#### **D. UNIT DESIGN:**



**VCU-UNIT.ALT 402-25.5**

Management Prescription: **Timber Production**  
Natural Stand Condition: **Old Growth**  
Desired Future Condition **Even aged**

Acres Even Aged: **22**  
Acres 2-Aged: **0**  
Acres Uneven Aged **0**  
Volume(MBF) **739.2**

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: **77** Flight# **4** Photo# **43**

**RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

Unit is seen from Rowan Bay - meet VQO of Modification.  
Two Class III streams within unit and one along the west unit boundary - maintain stream channel stability.  
Two Class IV streams in unit.  
Two Class II streams along southern unit boundary.  
Wildlife - maintain wildlife corridors.  
South winds predominate - incorporate disturbance ecology principles.

**II. IMPLEMENTATION ACTIVITIES**

**A. ECOSYSTEMS MANAGEMENT:**

**1. Vegetation:**

Stand has no apparent cohort with area of cedar dieback.

**2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Both Class II streams to the south are in the Moderate Gradient/Mixed Control Process Group. Manage the area 120 feet beyond the no-cut buffer for windfirmness. Since south winds predominate, the buffer along the unit boundary should be windfirm.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The three Class III streams are in the High Gradient Contained Process Group. Manage the area 120 feet beyond the V-notch for windfirmness, paying special attention to the southeast aspect.

Class IV: Leave wind resistant buffer consisting of trees less than 16 inches dbh within 20' of the Class IV stream. Splitline on the stream. (BMP 13.16 Stream Channel Protection)

**3. Wildlife Habitat:**

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.

**4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets modification VQO as designed.

**B. TRANSPORTATION SYSTEM:**

Specified road 46041 runs along the bottom of the unit. A temporary spur crossing a low gradient class II stream is planned to access the eastern setting. A 36" cnp which will allow fish passage is planned for this crossing. All drainage structures will be removed from the temporary spur to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

**C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Evenage Clearcut with 15% retention of large wildlife legacy trees using cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

**D. UNIT DESIGN:**

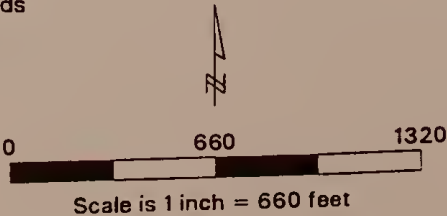
South side of the Class II buffer is undisturbed, so should retain natural windfirmness. There is some risk from east winds. The backline is intentionally irregular and undulating, so as not to appear blocky and harsh on the landscape.

**Crane/Rowan Timber Harvest Unit 402-25**



- Proposed Unit Boundaries
- Non-NF Lands
- Existing and Planned Managed Stands
- Riparian Management Area
- AHMU-Class 1 Streams
- AHMU-Class 2 Streams
- AHMU-Class 3 Streams
- AHMU-Class 4 Streams

- Existing Forest Development Roads
- Existing Closed Roads
- Proposed Forest Development Roads
- Proposed Temporary Roads
- 500-ft. Contour Interval
- 100-ft. Contour Interval





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-25.2

Management Prescription: **Timber Production**

Acres Even Aged: 22

Natural Stand Condition: **Old Growth**

Acres 2-Aged: 0

Desired Future Condition **Even aged**

Acres Uneven Aged 0

Volume(MBF) 739.2

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77 Flight# 4 Photo# 43

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit is seen from Rowan Bay - meet VQO of Modification.

Two Class III streams within unit and one along the west unit boundary - maintain stream channel stability.

Two Class IV streams in unit.

Two Class II streams along southern unit boundary.

Wildlife - maintain wildlife corridors.

South winds predominate - incorporate disturbance ecology principles.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand has no apparent cohort with area of cedar dieback.

##### **2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Both Class II streams to the south are in the Moderate Gradient/Mixed Control Process Group. Manage the area 120 feet beyond the no-cut buffer for windfirmness. Since south winds predominate, the buffer along the unit boundary should be windfirm.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The three Class III streams are in the High Gradient Contained Process Group. Manage the area 120 feet beyond the V-notch for windfirmness, paying special attention to the southeast aspect.

Class IV: Leave wind resistant buffer consisting of trees less than 16 inches dbh within 20' of the Class IV stream. Splitline on the stream. (BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape.

Unit meets modification VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46041 runs along the bottom of the unit. A temporary spur crossing a low gradient class II stream is planned to access the eastern setting. A 36" cmp which will allow fish passage is planned for this crossing. All drainage structures will be removed from the temporary spur to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Evenage Clearcut with 15% retention of large wildlife legacy trees using cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

#### **D. UNIT DESIGN:**

South side of the Class II buffer is undisturbed, so should retain natural windfirmness. There is some risk from east winds. The backline is intentionally irregular and undulating, so as not to appear blocky and harsh on the landscape.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-25.3

Management Prescription: **Timber Production**

Acres Even Aged: 22

Natural Stand Condition: **Old Growth**

Acres 2-Aged: 0

Desired Future Condition **Even-aged**

Acres Uneven Aged 0

Volume(MBF) 739.2

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77 Flight# 4 Photo# 43

### **I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

Unit is seen from Rowan Bay - meet VQO of Modification.

Two Class III streams within unit and one along the west unit boundary - maintain stream channel stability.

Two Class IV streams in unit.

Two Class II streams along southern unit boundary.

Wildlife - maintain wildlife corridors.

South winds predominate - incorporate disturbance ecology principles.

### **II. IMPLEMENTATION ACTIVITIES**

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand has no apparent cohort with area of cedar dieback.

##### **2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Both Class II streams to the south are in the Moderate Gradient/Mixed Control Process Group. Manage the area 120 feet beyond the no-cut buffer for windfirmness. Since south winds predominate, the buffer along the unit boundary should be windfirm.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The three Class III streams are in the High Gradient Contained Process Group. Manage the area 120 feet beyond the V-notch for windfirmness, paying special attention to the southeast aspect.

Class IV: Leave wind resistant buffer consisting of trees less than 16 inches dbh within 20' of the Class IV stream. Splitline on the stream. (BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets modification VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46041 runs along the bottom of the unit. A temporary spur crossing a low gradient class II stream is planned to access the eastern setting. A 36" cmp which will allow fish passage is planned for this crossing. All drainage structures will be removed from the temporary spur to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Evenage Clearcut with 15% retention of large wildlife legacy trees using cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

#### **D. UNIT DESIGN:**

South side of the Class II buffer is undisturbed, so should retain natural windfirmness. There is some risk from east winds. The backline is intentionally irregular and undulating, so as not to appear blocky and harsh on the landscape.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-25.4

Management Prescription: **Timber Production**

Natural Stand Condition: **Old Growth**

Desired Future Condition

Acres Even Aged: 0

Acres 2-Aged: 0

Acres Uneven Aged 0

Volume(MBF) 0

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77 Flight# 4 Photo# 43

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit not in this alternative.

### II. IMPLEMENTATION ACTIVITIES

#### A. ECOSYSTEMS MANAGEMENT:

1. Vegetation:

2. Aquatic Habitat:

3. Wildlife Habitat:

4. Visuals:

#### B. TRANSPORTATION SYSTEM:

#### C. SILVICULTURAL PRESCRIPTION SUMMARY:

#### D. UNIT DESIGN:



CRANE and ROWAN MOUNTAIN UNIT PLAN

VCU-UNIT.ALT 402-26.5

Management Prescription: Timber Production

Natural Stand Condition: Stem Exclusion/Understory Reinitiation

Desired Future Condition: Even aged

Acres Even Aged: 25

Acres 2-Aged: 0

Acres Uneven Aged: 0

Volume(MBF) 840

USGS 1/4 QUAD MAP #: PTA C1 NW

Aerial Photo: 77 Flight# 3A Photo# 7

I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit is seen from Rowan Bay - meet VQO of Modification.  
Class III stream along west unit boundary.  
Three Class IV streams in unit - maintain stream channel stability.  
South winds predominate - incorporate disturbance ecology principles.  
Moderately unstable soils in upper portion of unit - maintain soil stability.

II. IMPLEMENTATION ACTIVITIES

A. ECOSYSTEMS MANAGEMENT:

1. Vegetation:

West side is 100 year stem exclusion. East side is older cohort of understory reinitiation. Entire stand has heavy mistletoe, and severe fluting. Occasional large Cedar.

2. Aquatic Habitat:

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection;BMP 13.16 Stream Channel Protection) The stream along the west boundary is in the High Gradient Contained Process Group. Manage the area 120 feet beyond the V-notch for windfirmness, paying special attention to the southeast aspect.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream.( BMP13.16 Stream Channel Protection) Class IV in center of unit will be split on. Leave wind resistant buffer consisting of trees less than 16 inches dbh within 20' of the Class IV stream.

3. Wildlife Habitat:

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.

4. Visuals:

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape.  
Unit meets modification VQO as designed.

B. TRANSPORTATION SYSTEM:

Specified road 46041 runs through the lower portion of the unit.

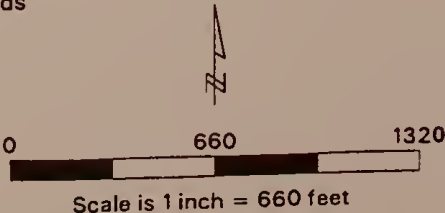
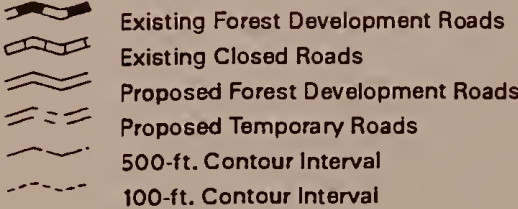
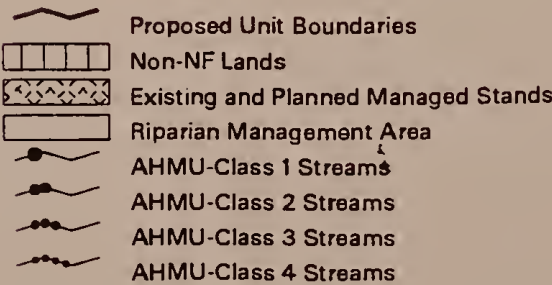
C. SILVICULTURAL PRESCRIPTION SUMMARY:

(a) is Evenaged Clearcut with 15% retention of large wildlife legacy trees using downhill cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. (b) is same as (a) with uphill cable yarding.

D. UNIT DESIGN:

Partial suspension required, unit designed for running skyline.  
Eastern edge is directly adjacent to the slide. Unit has been shaped to be compatible with the form and line of this landslide.  
Maintain boundary as shown on map and photo overlay to ensure meeting Modification VQO.  
Southwestern boundary is defined by an additional Class III stream.  
Eastern boundary is located along a natural opening to avoid windthrow.

Crane/Rowan Timber Harvest Unit 402-26





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-26.2

Management Prescription: **Timber Production**

Acres Even Aged: 25

Natural Stand Condition: **Stem Exclusion/Understory Reinitiation**

Acres 2-Aged: 0

Desired Future Condition **Even aged**

Acres Uneven Aged 0

Volume(MBF) 840

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77 Flight# 3A Photo# 7

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit is seen from Rowan Bay - meet VQO of Modification.  
Wildlife - maintain wildlife habitat.  
Class III stream along west unit boundary.  
Three Class IV streams in unit - maintain stream channel stability.  
South winds predominate - incorporate disturbance ecology principles.  
Moderately unstable soils in upper portion of unit - maintain soil stability.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

West side is 100 year stem exclusion. East side is older cohort of understory reinitiation. Entire stand has heavy mistletoe, and severe fluting. Occasional large Cedar.

##### **2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream along the west boundary is in the High Gradient Contained Process Group. Manage the area 120 feet beyond the V-notch for windfirmness, paying special attention to the southeast aspect.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection) Class IV in center of unit will be split on. Leave wind resistant buffer consisting of trees less than 16 inches dbh within 20' of the Class IV stream.

##### **3. Wildlife Habitat:**

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape.  
Unit meets modification VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46041 runs through the lower portion of the unit.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) is Evenaged Clearcut with 15% retention of large wildlife legacy trees using downhill cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. (b) is same as (a) with uphill cable yarding.

#### **D. UNIT DESIGN:**

Partial suspension required, unit designed for running skyline.  
Eastern edge is directly adjacent to the slide. Unit has been shaped to be compatible with the form and line of this landslide.  
Maintain boundary as shown on map and photo overlay to ensure meeting Modification VQO.  
Southwestern boundary is defined by an additional Class III stream.  
Eastern boundary is located along a natural opening to avoid windthrow.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-26.3

Management Prescription: **Timber Production**

Acres Even Aged: 17

Natural Stand Condition: **Stem Exclusion/Understory Reinitiation**

Acres 2-Aged: 8

Desired Future Condition **Even aged, 2-aged mixture**

Acres Uneven Aged 0

Volume(MBF) 723.2

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77 Flight# 3A Photo# 7

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit is seen from Rowan Bay - meet VQO of Modification.

Class III stream along west unit boundary.

Three Class IV streams in unit - maintain stream channel stability.

South winds predominate - incorporate disturbance ecology principles.

Moderately unstable soils in upper portion of unit - maintain soil stability.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

West side is 100 year stem exclusion. East side is older cohort of understory reinitiation. Entire stand has heavy mistletoe, and severe fluting. Occasional large Cedar.

##### **2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream along the west boundary is in the High Gradient Contained Process Group. Manage the area 120 feet beyond the V-notch for windfirmness, paying special attention to the southeast aspect.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection) Class IV in center of unit will be split on. Leave wind resistant buffer consisting of trees less than 16 inches dbh within 20' of the Class IV stream.

##### **3. Wildlife Habitat:**

Reserve trees will be retained in all alternatives that prescribe even-aged management. Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Part of the unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape.  
Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46041 runs through the lower portion of the unit.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) is Clearcut with 15% retention of large wildlife legacy trees using downhill cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. (b) is 2-aged Seedtree with reserves (upper and lower diameter limit Rx for hemlock and cedar, paint for reserve 1 large spruce every 10 acres) using uphill running skyline cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

Partial suspension required, unit designed for running skyline.

Eastern edge is directly adjacent to the slide. Unit has been shaped to be compatible with the form and line of this landslide.

Maintain boundary as shown on map and photo overlay to ensure meeting Modification VQO.

Southwestern boundary is defined by an additional Class III stream.

Eastern boundary is located along a natural opening to avoid windthrow.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-26.4

Management Prescription: **Timber Production**

Acres Even Aged: 17

Natural Stand Condition: **Stem Exclusion/Understory Reinitiation**

Acres 2-Aged: 8

Desired Future Condition **Even aged, 2-aged mixture**

Acres Uneven Aged 0

Volume(MBF) 723.2

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77 Flight# 3A Photo# 7

### **I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

Unit is seen from Rowan Bay - meet VQO of Modification.

Class III stream along west unit boundary.

Three Class IV streams in unit - maintain stream channel stability.

South winds predominate - incorporate disturbance ecology principles

Moderately unstable soils in upper portion of unit - maintain soil stability.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### **II. IMPLEMENTATION ACTIVITIES**

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

West side is 100 year stem exclusion. East side is older cohort of understory reinitiation. Entire stand has heavy mistletoe, and severe fluting. Occasional large Cedar.

##### **2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream along the west boundary is in the High Gradient Contained Process Group. Manage the area 120 feet beyond the V-notch for windfirmness, paying special attention to the southeast aspect.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection) Class IV in center of unit will be split on. Leave wind resistant buffer consisting of trees less than 16 inches dbh within 20' of the Class IV stream.

##### **3. Wildlife Habitat:**

Reserve trees will be retained in all alternatives that prescribe even-aged management. Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Part of the unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape.  
Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46041 runs through the lower portion of the unit.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) is Clearcut with 15% retention of large wildlife legacy trees using downhill cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. (b) is 2-aged Seedtree with reserves (upper and lower diameter limit Rx for hemlock and cedar, paint for reserve 1 large spruce every 10 acres) using uphill running skyline cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

Partial suspension required, unit designed for running skyline.

Eastern edge is directly adjacent to the slide. Unit has been shaped to be compatible with the form and line of this landslide.

Maintain boundary as shown on map and photo overlay to ensure meeting Modification VQO.

Southwestern boundary is defined by an additional Class III stream.

Eastern boundary is located along a natural opening to avoid windthrow.



# CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-26.5

Management Prescription: **Timber Production**

Natural Stand Condition: **Stem Exclusion/Understory Reinitiation**

Desired Future Condition **Even aged**

Acres Even Aged: 25

Acres 2-Aged: 0

Acres Uneven Aged 0

Volume(MBF) 840

USGS 1/4 QUAD MAP #: PTA C1 NW

Aerial Photo: 77 Flight# 3A Photo# 7

## RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit is seen from Rowan Bay - meet VQO of Modification.  
Class III stream along west unit boundary.  
Three Class IV streams in unit - maintain stream channel stability.  
South winds predominate - incorporate disturbance ecology principles.  
Moderately unstable soils in upper portion of unit - maintain soil stability.

## II. IMPLEMENTATION ACTIVITIES

### A. ECOSYSTEMS MANAGEMENT:

#### 1. Vegetation:

West side is 100 year stem exclusion. East side is older cohort of understory reinitiation. Entire stand has heavy mistletoe, and severe fluting. Occasional large Cedar.

#### 2. Aquatic Habitat:

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection;BMP 13.16 Stream Channel Protection) The stream along the west boundary is in the High Gradient Contained Process Group. Manage the area 120 feet beyond the V-notch for windfirmness, paying special attention to the southeast aspect.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream.( BMP13.16 Stream Channel Protection) Class IV in center of unit will be split on. Leave wind resistant buffer consisting of trees less than 16 inches dbh within 20' of the Class IV stream.

#### 3. Wildlife Habitat:

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.

#### 4. Visuals:

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape.  
Unit meets modification VQO as designed.

### B. TRANSPORTATION SYSTEM:

Specified road 46041 runs through the lower portion of the unit.

### C. SILVICULTURAL PRESCRIPTION SUMMARY:

(a) is Evenaged Clearcut with 15% retention of large wildlife legacy trees using downhill cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. (b) is same as (a) with uphill cable yarding.

### D. UNIT DESIGN:

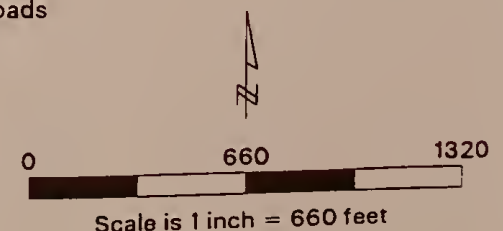
Partial suspension required, unit designed for running skyline.  
Eastern edge is directly adjacent to the slide. Unit has been shaped to be compatible with the form and line of this landslide.  
Maintain boundary as shown on map and photo overlay to ensure meeting Modification VQO.  
Southwestern boundary is defined by an additional Class III stream.  
Eastern boundary is located along a natural opening to avoid windthrow.

## Crane/Rowan Timber Harvest Unit 402-26



- Proposed Unit Boundaries
- Non-NF Lands
- Existing and Planned Managed Stands
- Riparian Management Area
- AHMU-Class 1 Streams
- AHMU-Class 2 Streams
- AHMU-Class 3 Streams
- AHMU-Class 4 Streams

- Existing Forest Development Roads
- Existing Closed Roads
- Proposed Forest Development Roads
- Proposed Temporary Roads
- 500-ft. Contour Interval
- 100-ft. Contour Interval





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-27.2

Acres Even Aged: 16

Management Prescription: **Timber Production**

Acres 2-Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres Uneven Aged 0

Desired Future Condition **Even aged**

Volume(MBF) 537.6

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: **77**

Flight# **3a**

Photo# **7**

### **I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

Unit in deer winter range - protect habitat.  
Unit is visible from Rowan Bay - meet VQO of Modification.  
Class III stream along eastern boundary - maintain stream channel stability.  
Two Class IV streams in unit and one along western boundary.  
South winds predominate - incorporate disturbance ecology principles.

### **II. IMPLEMENTATION ACTIVITIES**

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Early Understory Reinitiation, dense stand of even aged almost pure spruce of landslide origin (120 years). Small patch of Old Growth on east side with good Cedar.

##### **2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The Class III stream to the southeast is in the High Gradient Contained Process Group. Manage the area 120 feet from the V-notch to provide for windfirmness. Since South winds predominate, the no-cut buffer is expected to be windfirm.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection) Leave a wind resistant buffer consisting of trees less than 16 inches dbh within 20' of the Class IV stream along the west boundary.

##### **3. Wildlife Habitat:**

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets modification VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46041 runs through the lower portion of the unit. A temporary spur is planned to access a landing on a bench further upslope in the unit. All drainage structures will be removed from the temporary spur to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Evenage Clearcut with 15% retention of large wildlife legacy trees using cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

#### **D. UNIT DESIGN:**

Windthrow has occurred in the past from southeast winds; unit has been oriented parallel to the wind.

Unit is designed to work with planned, adjacent openings using features found in the landscape with the intent to meet the visual objective.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-27.3

Management Prescription: **Timber Production**

Acres Even Aged: 16

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 0

Desired Future Condition **Even aged, 2-aged mixture**

Acres Uneven Aged 0

Volume(MBF) 537.6

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77

Flight# 3a

Photo# 7

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit in deer winter range - protect habitat.

Unit is visible from Rowan Bay - meet VQO of Modification.

Class III stream along eastern boundary - maintain stream channel stability.

Two Class IV streams in unit and one along western boundary.

South winds predominate - incorporate disturbance ecology principles.

Maintain habitat for important wildlife species through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Early Understory Reinitiation, dense stand of even aged almost pure spruce of landslide origin (120 years). Small patch of Old Growth on east side with good Cedar.

##### **2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection;BMP 13.16 Stream Channel Protection) The Class III stream to the southeast is in the High Gradient Contained Process Group. Manage the area 120 feet from the V-notch to provide for windfirmness. Since South winds predominate, the no-cut buffer is expected to be windfirm.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream.( BMP 13.16 Stream Channel Protection) Leave a wind resistant buffer consisting of trees less than 16 inches dbh within 20' of the Class IV stream along the west boundary.

##### **3. Wildlife Habitat:**

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46041 runs through the lower portion of the unit. A temporary spur is planned to access a landing on a bench further upslope in the unit. All drainage structures will be removed from the temporary spur to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Evenage Clearcut with 15% retention of large wildlife legacy trees using cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

#### **D. UNIT DESIGN:**

Windthrow has occurred in the past from southeast winds; unit has been oriented parallel to the wind.

Unit is designed to work with planned, adjacent openings using features found in the landscape with the intent to meet the visual objective.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-27.4

Management Prescription: **Timber Production**

Acres Even Aged: 16

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 0

Desired Future Condition **Even aged**

Acres Uneven Aged 0

Volume(MBF) 537.6

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77 Flight# 3a Photo# 7

### **I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

Unit in deer winter range - protect habitat.  
Unit is visible from Rowan Bay - meet VQO of Modification.  
Class III stream along eastern boundary - maintain stream channel stability.  
Two Class IV streams in unit and one along western boundary.  
South winds predominate - incorporate disturbance ecology principles.  
Unit is visible from Rowan Bay - meet VQO of Modification.  
Maintain habitat for important wildlife species through alternative silvicultural prescription.  
South winds predominate - maintain windfirmness.

### **II. IMPLEMENTATION ACTIVITIES**

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Early Understory Reinitiation, dense stand of even aged almost pure spruce of landslide origin (120 years). Small patch of Old Growth on east side with good Cedar.

##### **2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The Class III stream to the southeast is in the High Gradient Contained Process Group. Manage the area 120 feet from the V-notch to provide for windfirmness. Since South winds predominate, the no-cut buffer is expected to be windfirm.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection) Leave a wind resistant buffer consisting of trees less than 16 inches dbh within 20' of the Class IV stream along the west boundary.

##### **3. Wildlife Habitat:**

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46041 runs through the lower portion of the unit. A temporary spur is planned to access a landing on a bench further upslope in the unit. All drainage structures will be removed from the temporary spur to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Evenage Clearcut with 15% retention of large wildlife legacy trees using cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

#### **D. UNIT DESIGN:**

Windthrow has occurred in the past from southeast winds; unit has been oriented parallel to the wind.  
Unit is designed to work with planned, adjacent openings using features found in the landscape with the intent to meet the visual objective.



**VCU-UNIT.ALT** 402-27.5

Acres Even Aged: 16

Management Prescription: Timber Production

Acres 2-Aged: 0

Natural Stand Condition: Understory Reinitiation

Acres Uneven Aged 0

Desired Future Condition Even aged

Volume(MBF) 537.6

USGS 1/4 QUAD MAP #: PTA C1 NW

Aerial Photo: 77 Flight# 3a Photo# 7

**I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

- Unit in deer winter range - protect habitat.
- Unit is visible from Rowan Bay - meet VQO of Modification.
- Class III stream along eastern boundary - maintain stream channel stability.
- Two Class IV streams in unit and one along western boundary.
- South winds predominate - incorporate disturbance ecology principles.

**II. IMPLEMENTATION ACTIVITIES**

**A. ECOSYSTEMS MANAGEMENT:**

**1. Vegetation:**

Early Understory Reinitiation, dense stand of even aged almost pure spruce of landslide origin (120 years). Small patch of Old Growth on east side with good Cedar.

**2. Aquatic Habitat:**

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection;BMP 13.16 Stream Channel Protection) The Class III stream to the southeast is in the High Gradient Contained Process Group. Manage the area 120 feet from the V-notch to provide for windfirmness. Since South winds predominate, the no-cut buffer is expected to be windfirm.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream.( BMP 13.16 Stream Channel Protection) Leave a wind resistant buffer consisting of trees less than 16 inches dbh within 20' of the Class IV stream along the west boundary.

**3. Wildlife Habitat:**

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.

**4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets modification VQO as designed.

**B. TRANSPORTATION SYSTEM:**

Specified road 46041 runs through the lower portion of the unit. A temporary spur is planned to access a landing on a bench further upslope in the unit. All drainage structures will be removed from the temporary spur to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

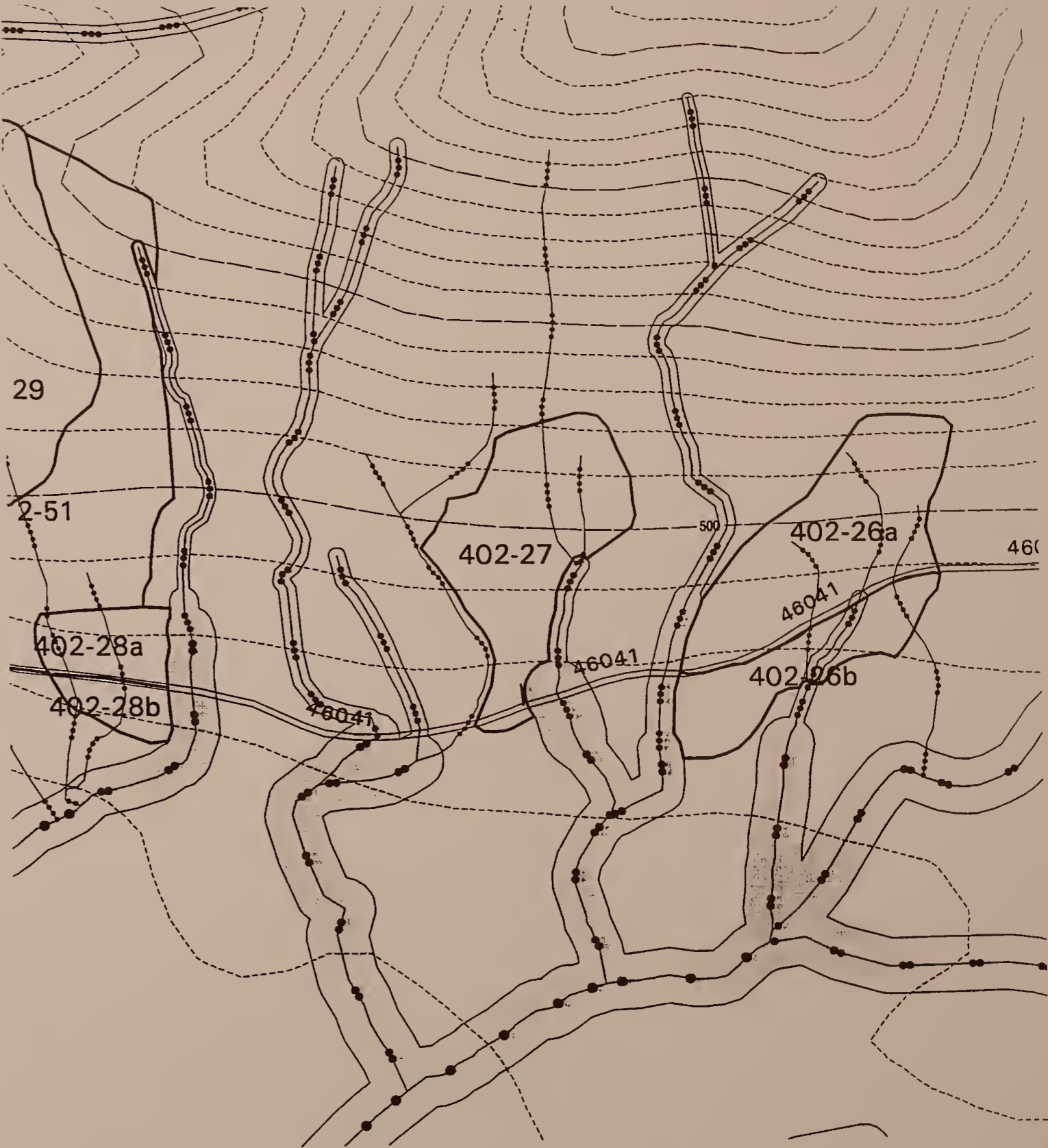
**C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Evenage Clearcut with 15% retention of large wildlife legacy trees using cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

**D. UNIT DESIGN:**

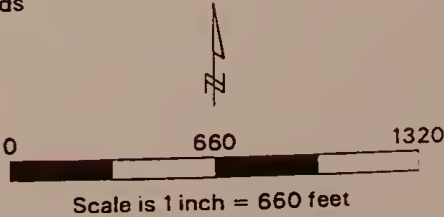
Windthrow has occurred in the past from southeast winds; unit has been oriented parallel to the wind. Unit is designed to work with planned, adjacent openings using features found in the landscape with the intent to meet the visual objective.

Crane/Rowan Timber Harvest Unit 402-27



- Proposed Unit Boundaries
- Non-NF Lands
- Existing and Planned Managed Stands
- Riparian Management Area
- AHMu-Class 1 Streams
- AHMu-Class 2 Streams
- AHMu-Class 3 Streams
- AHMu-Class 4 Streams

- Existing Forest Development Roads
- Existing Closed Roads
- Proposed Forest Development Roads
- Proposed Temporary Roads
- 500-ft. Contour Interval
- 100-ft. Contour Interval





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-28.2

Management Prescription: **Timber Production**

Acres Even Aged: 7

Natural Stand Condition: **Old Growth**

Acres 2-Aged: 0

Desired Future Condition **Even aged**

Acres Uneven Aged 0

Volume(MBF) 235.2

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77 Flight# 3A Photo# 8

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class II stream adjacent to unit - maintain riparian buffer.  
Two Class IV streams in unit.  
Unit is seen from Rowan Bay - meet VQO of Modification.  
Estuary habitat southwest of unit - maintain habitat.  
Southeast winds predominate - incorporate disturbance ecology principles.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand has no apparent cohorts. Is moderately poor drainage.

##### **2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The Class II stream along the east boundary is in the High Gradient Contained Process Group. Manage the area 120 feet beyond the no harvest buffer for windfirmness. Since South winds predominate, the no-cut buffer is expected to be windfirm.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection)

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46041 ends at the east boundary of unit 402-28. A temporary spur is planned to run through this unit and continue on to 402-29. The landing for this unit will also serve helicopter units 402-29 and 402-51. All drainage structures will be removed from the temporary spur to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) is Evenaged Clearcut with 15% retention of large wildlife legacy trees using downhill cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. (b) is same as (a) with uphill cable yarding.

#### **D. UNIT DESIGN:**

Use Class II stream on east side as boundary.  
Past windthrow has occurred from southeast winds. Unit has been oriented parallel to these winds.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT 402-28.3**

Management Prescription: **Timber Production**

Acres Even Aged: 4

Natural Stand Condition: **Old Growth**

Acres 2-Aged: 3

Desired Future Condition **Even aged, 2-aged mixture**

Acres Uneven Aged 0

Volume(MBF) 191.4

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77

Flight# 3A

Photo#

8

### **I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

Class II stream adjacent to unit - maintain riparian buffer.

Two Class IV streams in unit.

Unit is seen from Rowan Bay - meet VQO of Modification.

Estuary habitat southwest of unit - maintain habitat.

Southeast winds predominate - incorporate disturbance ecology principles.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### **II. IMPLEMENTATION ACTIVITIES**

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand has no apparent cohorts. Is moderately poor drainage.

##### **2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The Class II stream along the east boundary is in the High Gradient Contained Process Group. Manage the area 120 feet beyond the no harvest buffer for windfirmness. Since South winds predominate, the no-cut buffer is expected to be windfirm.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection)

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management. Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Part of the unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46041 ends at the east boundary of unit 402-28. A temporary spur is planned to run through this unit and continue on to 402-29. The landing for this unit will also serve helicopter units 402-29 and 402-51. All drainage structures will be removed from the temporary spur to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) is Clearcut with 15% retention of large wildlife legacy trees using downhill cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. (b) is 2-aged Seedtree with reserves (upper and lower diameter limit Rx for hemlock and cedar, paint for reserve 1 large spruce every 10 acres) using uphill running skyline cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

Use Class II stream on east side as boundary.

Past windthrow has occurred from southeast winds. Unit has been oriented parallel to these winds.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-28.4

Management Prescription: **Timber Production**

Acres Even Aged: 4

Natural Stand Condition: **Old Growth**

Acres 2-Aged: 3

Desired Future Condition **Even aged, 2-aged mixture**

Acres Uneven Aged 0

Volume(MBF) 191.4

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77

Flight# 3A

Photo# 8

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class II stream adjacent to unit - maintain riparian buffer.

Two Class IV streams in unit.

Unit is seen from Rowan Bay - meet VQO of Modification.

Estuary habitat southwest of unit - maintain habitat.

Southeast winds predominate - incorporate disturbance ecology principles

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand has no apparent cohorts. Is moderately poor drainage.

##### **2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The Class II stream along the east boundary is in the High Gradient Contained Process Group. Manage the area 120 feet beyond the no harvest buffer for windfirmness. Since South winds predominate, the no-cut buffer is expected to be windfirm.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection)

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream.( BMP13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management. Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Part of the unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46041 ends at the east boundary of unit 402-28. A temporary spur is planned to run through this unit and continue on to 402-29. The landing for this unit will also serve helicopter units 402-29 and 402-51. All drainage structures will be removed from the temporary spur to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) is Clearcut with 15% retention of large wildlife legacy trees using downhill cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. (b) is 2-aged Seedtree with reserves (upper and lower diameter limit Rx for hemlock and cedar, paint for reserve 1 large spruce every 10 acres) using uphill running skyline cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

Use Class II stream on east side as boundary.

Past windthrow has occurred from southeast winds. Unit has been oriented parallel to these winds.



CRANE and ROWAN MOUNTAIN UNIT PLAN

VCU-UNIT.ALT 402-28.5		Acres Even Aged: 7
Management Prescription:	Timber Production	Acres 2-Aged: 0
Natural Stand Condition:	Old Growth	Acres Uneven Aged 0
Desired Future Condition	Even aged	Volume(MBF) 235.2
USGS 1/4 QUAD MAP #:	PTA C1 NW	Aerial Photo: 77 Flight# 3A Photo# 8

RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

- Class II stream adjacent to unit - maintain riparian buffer.
- Two Class IV streams in unit.
- Unit is seen from Rowan Bay - meet VQO of Modification.
- Estuary habitat southwest of unit - maintain habitat.
- Southeast winds predominate -incorporate disturbance ecology principles

IMPLEMENTATION ACTIVITIES

ECOSYSTEMS MANAGEMENT:

- Vegetation:**  
Stand has no apparent cohorts. Is moderately poor drainage.
- Aquatic Habitat:**  
Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The Class II stream along the east boundary is in the High Gradient Contained Process Group. Manage the area 120 feet beyond the no harvest buffer for windfirmness. Since South winds predominate, the no-cut buffer is expected to be windfirm.  
Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection)  
  
Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream.( BMP13.16 Stream Channel Protection)
- Wildlife Habitat:**  
Unit is in high deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.
- Visuals:**  
Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

B. TRANSPORTATION SYSTEM:

Specified road 46041 ends at the east boundary of unit 402-28. A temporary spur is planned to run through this unit and continue on to 402-29. The landing for this unit will also serve helicopter units 402-29 and 402-51. All drainage structures will be removed from the temporary spur to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

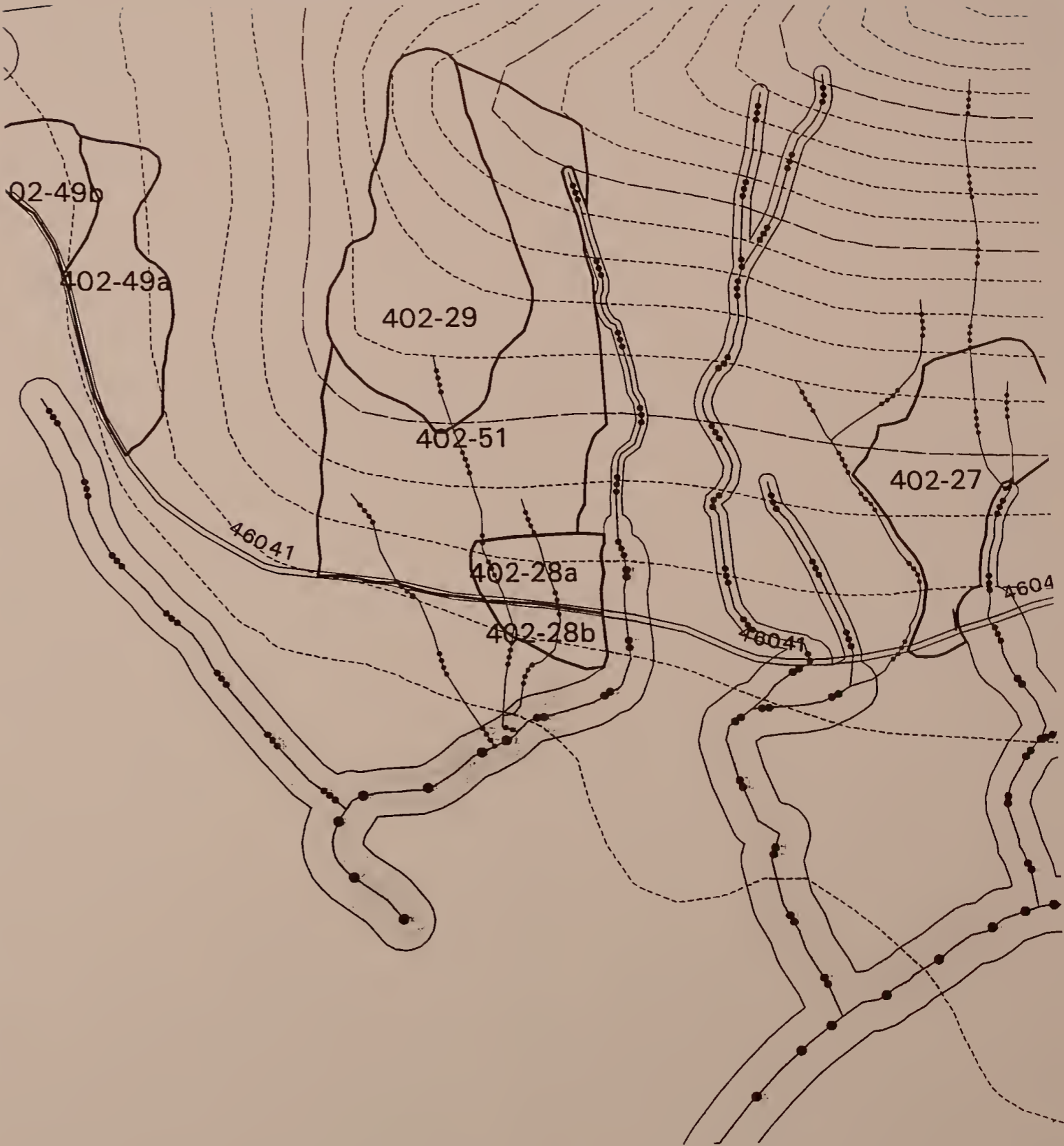
C. SILVICULTURAL PRESCRIPTION SUMMARY:

(a) is Evenaged Clearcut with 15% retention of large wildlife legacy trees using downhill cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. (b) is same as (a) with uphill cable yarding.

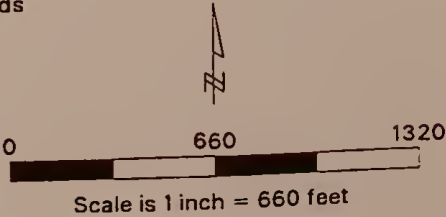
D. UNIT DESIGN:

Use Class II stream on east side as boundary.  
Past windthrow has occurred from southeast winds. Unit has been oriented parallel to these winds.

Crane/Rowan Timber Harvest Unit 402-28



- |  |                                     |  |                                   |
|--|-------------------------------------|--|-----------------------------------|
|  | Proposed Unit Boundaries            |  | Existing Forest Development Roads |
|  | Non-NF Lands                        |  | Existing Closed Roads             |
|  | Existing and Planned Managed Stands |  | Proposed Forest Development Roads |
|  | Riparian Management Area            |  | Proposed Temporary Roads          |
|  | AHMU-Class 1 Streams                |  | 500-ft. Contour Interval          |
|  | AHMU-Class 2 Streams                |  | 100-ft. Contour Interval          |
|  | AHMU-Class 3 Streams                |  |                                   |
|  | AHMU-Class 4 Streams                |  |                                   |





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-29.2

Management Prescription: **Timber Production**

Acres Even Aged: 23

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 0

Desired Future Condition **Even aged**

Acres Uneven Aged 0

Volume(MBF) 772.8

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77 Flight# 3A Photo# 8

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Access "difficult" component of the ASQ - develop techniques for managing this component.

Unit is sen from Rowan Bay - meet VQO of Modification.

Southeast winds predominate - incorporate disturbance ecology principles

Class IV stream extends up into unit.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is understory reinitiation. Lower portion is multi-cohort, upper portion is 340 year old even aged dense stand with good spruce component. Small patch of 95 year old windthrow within stand from SE.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

No Class III streams in Unit.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream.( BMP13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 1000 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets modification VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing in 402-28 or 402-49.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Evenage Clearcut with 15% retention of large wildlife legacy trees using helicopter yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

#### **D. UNIT DESIGN:**

Multi-entry plan for this hillside is to progressively harvest units into the wind.

Northwest boundary of unit located on leeward side of ridge to afford topographic protection from southeast winds.

Unit designed for helicopter yarding.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT 402-29.3**

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 23

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 437

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77

Flight# 3A

Photo#

8

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Access "difficult" component of the ASQ - develop techniques for managing this component.

Unit is seen from Rowan Bay - meet VQO of Modification.

Southeast winds predominate - Incorporate disturbance ecology principles

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

Class IV stream extends up into unit.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is understory reinitiation. Lower portion is multi-cohort, upper portion is 340 year old even aged dense stand with good spruce component. Small patch of 95 year old windthrow within stand. (from SE)

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

No Class III streams in Unit.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream.

Partially suspend logs over the stream. (BMP13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing in 402-28 or 402-49.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

Multi-entry plan for this hillside is to progressively harvest units into the wind.

Northwest boundary of unit located on leeward side of ridge to afford topographic protection from southeast winds.

Unit designed for helicopter yarding.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-29.4

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 23

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 437

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77

Flight# 3A

Photo#

8

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Access "difficult" component of the ASQ - develop techniques for managing this component.

Unit is sen from Rowan Bay - meet VQO of Modification.

Southeast winds predominate - incorporate disturbance ecology principles.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

Class IV stream extends up into unit.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is understory reinitiation. Lower portion is multi-cohort, upper portion is 340 year old even aged dense stand with good spruce component. Small patch of 95 year old windthrow within stand. (from SE).

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

No Class III streams in Unit.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream.( BMP13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing in 402-28 or 402-49.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts;1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

Multi-entry plan for this hillside is to progressively harvest units into the wind.

Northwest boundary of unit located on leeward side of ridge to afford topographic protection from southeast winds.

Unit designed for helicopter yarding.



**VCU-UNIT.ALT 402-30.5**

Management Prescription: **Timber Production**

Natural Stand Condition: **Understory Reinitiation**

Desired Future Condition: **Even aged**

Acres Even Aged: 10

Acres 2-Aged: 0

Acres Uneven Aged: 0

Volume(MBF) 336

USGS 1/4 QUAD MAP #: **PTA C2 NE**

Aerial Photo: 77 Flight# 3A Photo# 8

**RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

Unit is seen from saltwater - meet VQO of Modification.

Class I and II stream adjacent to unit - maintain riparian buffer.

Class III stream within unit - maintain stream channel stability.

Unit located near sandy beach - maintain beach fringe habitat and provide recreational access.

South winds predominate - incorporate disturbance ecology principles.

**IMPLEMENTATION ACTIVITIES**

**A. ECOSYSTEMS MANAGEMENT:**

- Vegetation:**  
Stand is of wind origin in understory reinitiation stage.
- Aquatic Habitat:**  
Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Due to the orientation of the buffer to prevailing winds, it is expected to be windfirm.  
Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection)
- Wildlife Habitat:**  
Unit is in high deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.
- Visuals:**  
Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

**B. TRANSPORTATION SYSTEM:**

Planned helicopter unit will use landing in 402-49. This will avoid roading across several unstable class I alluvial stream channels.

**C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Evenage Clearcut with 15% retention of large wildlife legacy trees using helicopter yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

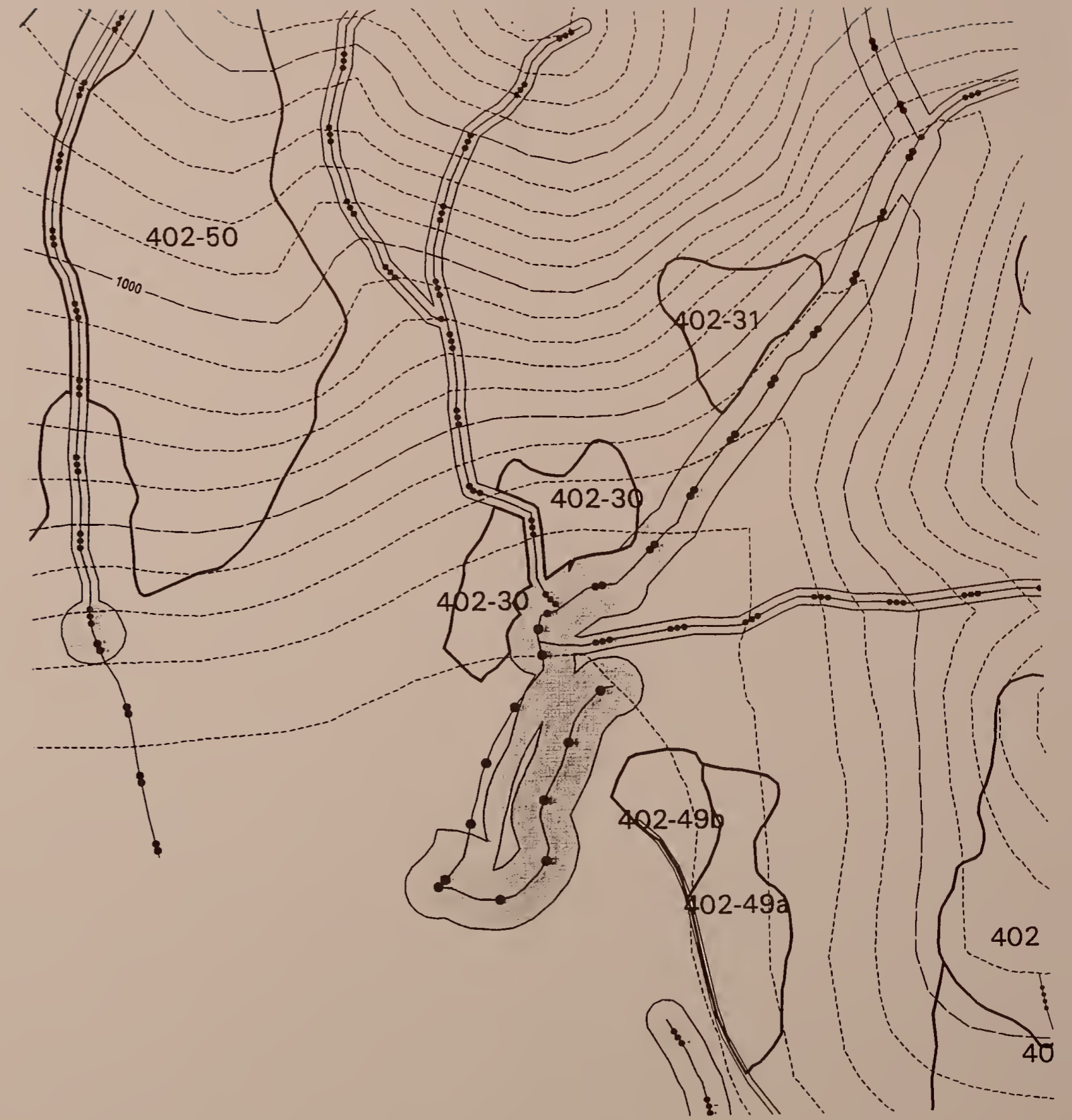
**D. UNIT DESIGN:**

Unit designed to work with landslide and landform features.

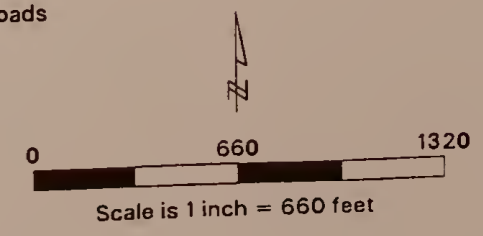
Timber along upper slope backline is expected to retain windfirmness naturally developed against winds perpendicular to slope.

Class III buffer is expected to be windfirm since it is parallel to prevailing winds.

**Crane/Rowan Timber Harvest Unit 402-30**



- |  |                                     |  |                                   |
|--|-------------------------------------|--|-----------------------------------|
|  | Proposed Unit Boundaries            |  | Existing Forest Development Roads |
|  | Non-NF Lands                        |  | Existing Closed Roads             |
|  | Existing and Planned Managed Stands |  | Proposed Forest Development Roads |
|  | Riparian Management Area            |  | Proposed Temporary Roads          |
|  | AHMU-Class 1 Streams                |  | 500-ft. Contour Interval          |
|  | AHMU-Class 2 Streams                |  | 100-ft. Contour Interval          |
|  | AHMU-Class 3 Streams                |  |                                   |
|  | AHMU-Class 4 Streams                |  |                                   |





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-30.2

Management Prescription: **Timber Production**

Acres Even Aged: 10

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 0

Desired Future Condition **Even aged**

Acres Uneven Aged 0

Volume(MBF) 336

USGS 1/4 QUAD MAP #: **PTA C2 NE**

Aerial Photo: 77

Flight# 3A Photo# 8

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit is seen from saltwater - meet VQO of Modification.  
Class I and II stream adjacent to unit - maintain riparian buffer.  
Class III stream within unit - maintain stream channel stability.  
Unit located near sandy beach - maintain beach fringe habitat and provide recreational access.  
South winds predominate - incorporate disturbance ecology principles.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is of wind origin in understory reinitiation stage.

##### **2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Due to the orientation of the buffer to prevailing winds, it is expected to be windfirm.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream in the center of the unit is in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch to provide for windfirmness of the no-cut buffer within the V-notch. South winds predominate.

##### **3. Wildlife Habitat:**

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Planned helicopter unit will use landing in 402-49. This will avoid roading across several unstable class I alluvial stream channels.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Evenage Clearcut with 15% retention of large wildlife legacy trees using helicopter yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

#### **D. UNIT DESIGN:**

Unit designed to work with landslide and landform features.  
Timber along upper slope backline is expected to retain windfirmness naturally developed against winds perpendicular to slope.  
Class III buffer is expected to be windfirm since it is parallel to prevailing winds.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-30.3

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 10

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 190

USGS 1/4 QUAD MAP #: **PTA C2 NE**

Aerial Photo: 77

Flight# 3A

Photo#

8

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit is seen from saltwater - meet VQO of Modification.

Class I and II stream adjacent to unit - maintain riparian buffer.

Class III stream within unit - maintain stream channel stability.

Unit located near sandy beach - maintain beach fringe habitat and provide recreational access.

South winds predominate - incorporate disturbance ecology principles.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is of wind origin in understory reinitiation stage.

##### **2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Due to the orientation of the buffer to prevailing winds, it is expected to be windfirm.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Planned helicopter unit will use landing in 402-49. This will avoid roading across several unstable class I alluvial stream channels.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and plant 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

Unit designed to work with landslide and landform features.

Timber along upper slope backline is expected to retain windfirmness naturally developed against winds perpendicular to slope.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-30.4

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 10

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 190

USGS 1/4 QUAD MAP #: **PTA C2 NE**

Aerial Photo: 77 Flight# 3A Photo# 8

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit is seen from saltwater - meet VQO of Modification.

Class I and II stream adjacent to unit - maintain riparian buffer.

Class III stream within unit - maintain stream channel stability.

Unit located near sandy beach - maintain beach fringe habitat and provide recreational access.

South winds predominate - incorporate disturbance ecology principles.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is of wind origin in understory reinitiation stage.

##### **2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Due to the orientation of the buffer to prevailing winds, it is expected to be windfirm.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Planned helicopter unit will use landing in 402-49. This will avoid roading across several unstable class I alluvial stream channels.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and plant 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

Unit designed to work with landslide and landform features.

Timber along upper slope backline is expected to retain windfirmness naturally developed against winds perpendicular to slope.

Class III buffer is expected to be windfirm since it is parallel to prevailing winds.



VCU-UNIT.ALT 402-31.5		Acres Even Aged: 8	
Management Prescription: Timber Production		Acres 2-Aged: 0	
Natural Stand Condition: Understory Reinitiation		Acres Uneven Aged: 0	
Desired Future Condition: Even aged		Volume(MBF): 268.8	
USGS 1/4 QUAD MAP #: PTA C2 NE		Aerial Photo: 77 Flight# 3A Photo# 7	

I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit visible from saltwater - maintain VQO of Partial Retention.  
Class II stream on the southeast side of unit - maintain riparian buffer.  
South winds predominate - incorporate disturbance ecology principles.

II. IMPLEMENTATION ACTIVITIES

A. ECOSYSTEMS MANAGEMENT:

1. Vegetation:  
Stand is of wind origin in understory reinitiation stage.
2. Aquatic Habitat:  
Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream along the unit boundary is in the High Gradient Contained Process Group. Manage the area within 120 feet of the no-cut buffer to provide for windfirmness. Since south winds predominate, the no-cut buffer should be windfirm.  
No Class III streams in Unit.
3. Wildlife Habitat:  
Unit is in high deer HSI value and high Marten HIS value. South facing slope below 1300 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.
4. Visuals:  
Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

B. TRANSPORTATION SYSTEM:

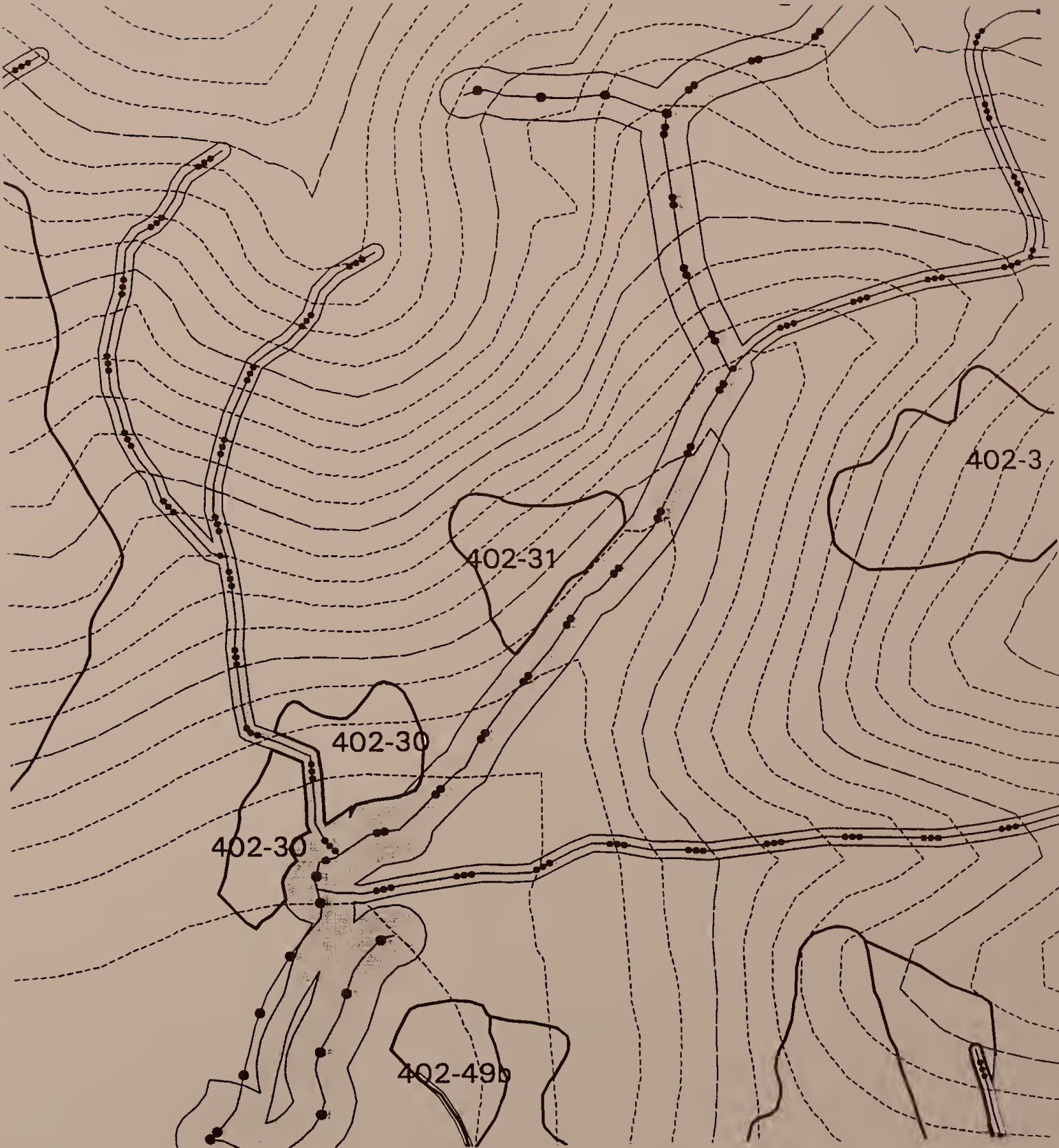
Planned helicopter unit will use landing in 402-49. Accessing this small unit by road would require approximately 400 feet of full bench and end haul construction, in addition to crossing several unstable class I alluvial stream channels.

C. SILVICULTURAL PRESCRIPTION SUMMARY:

Evenage Clearcut with 15% retention of large wildlife legacy trees using helicopter yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

D. UNIT DESIGN:

Small size and location of unit meets the Partial Retention VQO.  
Unit not at risk to windthrow due to location and small size.  
Unit designed for helicopter yarding.



- ~

Proposed Unit Boundaries
- |||||

Non-NF Lands
- |||||

Existing and Planned Managed Stands
- |||||

Riparian Management Area
- AHMU-Class 1 Streams
- AHMU-Class 2 Streams
- AHMU-Class 3 Streams
- AHMU-Class 4 Streams
- ~

Existing Forest Development Roads
- ~

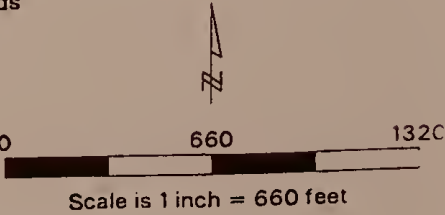
Existing Closed Roads
- ~

Proposed Forest Development Roads
- ~

Proposed Temporary Roads
- ~

500-ft. Contour Interval
- ~

100-ft. Contour Interval





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT 402-31.2**

Management Prescription: **Timber Production**

Acres Even Aged: 8

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 0

Desired Future Condition **Even aged**

Acres Uneven Aged 0

Volume(MBF) 268.8

USGS 1/4 QUAD MAP #: **PTA C2 NE**

Aerial Photo: 77 Flight# 3A Photo# 7

### **I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

Unit visible from saltwater - maintain VQO of Partial Retention.  
Class II stream on the southeast side of unit - maintain riparian buffer.  
South winds predominate - incorporate disturbance ecology principles.

### **II. IMPLEMENTATION ACTIVITIES**

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is of wind origin in understory reinitiation stage.

##### **2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream along the unit boundary is in the High Gradient Contained Process Group. Manage the area within 120 feet of the no-cut buffer to provide for windfirmness. Since south winds predominate, the no-cut buffer should be windfirm.

No Class III streams in Unit.

##### **3. Wildlife Habitat:**

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 1300 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Planned helicopter unit will use landing in 402-49. Accessing this small unit by road would require approximately 400 feet of full bench and end haul construction, in addition to crossing several unstable class I alluvial stream channels.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Evenage Clearcut with 15% retention of large wildlife legacy trees using helicopter yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

#### **D. UNIT DESIGN:**

Small size and location of unit meets the Partial Retention VQO.  
Unit not at risk to windthrow due to location and small size.  
Unit designed for helicopter yarding.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-31.3

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 8

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 152

USGS 1/4 QUAD MAP #: **PTA C2 NE**

Aerial Photo: 77 Flight# 3A Photo# 7

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit visible from saltwater - maintain VQO of Partial Retention.

Class II stream on the southeast side of unit - maintain riparian buffer.

South winds predominate - incorporate disturbance ecology principles.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is of wind origin in understory reinitiation stage.

##### **2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream along the unit boundary is in the High Gradient Contained Process Group. Manage the area within 120 feet of the no-cut buffer to provide for windfirmness. Since south winds predominate, the no-cut buffer should be windfirm.

No Class III streams in Unit.

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Planned helicopter unit will use landing in 402-49. Accessing this small unit by road would require approximately 400 feet of full bench and end haul construction, in addition to crossing several unstable class I alluvial stream channels.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

Small size and location of unit meets the Partial Retention VQO.

Unit not at risk to windthrow due to location and small size.

Unit designed for helicopter yarding.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT 402-31.4**

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 8

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 152

USGS 1/4 QUAD MAP #: **PTA C2 NE**

Aerial Photo: 77

Flight# 3A Photo# 7

### **I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

Unit visible from saltwater - maintain VQO of Partial Retention.

Class II stream on the southeast side of unit - maintain riparian buffer.

South winds predominate - incorporate disturbance ecology principles.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### **II. IMPLEMENTATION ACTIVITIES**

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is of wind origin in understory reinitiation stage.

##### **2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream along the unit boundary is in the High Gradient Contained Process Group. Manage the area within 120 feet of the no-cut buffer to provide for windfirmness. Since south winds predominate, the no-cut buffer should be windfirm.

No Class III streams in Unit.

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Planned helicopter unit will use landing in 402-49. Accessing this small unit by road would require approximately 400 feet of full bench and end haul construction, in addition to crossing several unstable class I alluvial stream channels.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

Small size and location of unit meets the Partial Retention VQO.

Unit not at risk to windthrow due to location and small size.

Unit designed for helicopter yarding.



# CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT 402-32.5**

Management Prescription: **Timber Production**

Natural Stand Condition: **Understory Reinitiation**

Desired Future Condition **Even aged**

Acres Even Aged: 22

Acres 2-Aged: 0

Acres Uneven Aged 0

Volume(MBF) 739.2

Aerial Photo: 77

Flight# 3A Photo# 7

USGS 1/4 QUAD MAP #: PTA C1 NW

## RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit visible from saltwater - meet VQO of Partial Retention.  
Moderately unstable soils in entire unit - maintain soil stability.  
South winds predominate - incorporate disturbance ecology principles.  
No streams in unit.

## IMPLEMENTATION ACTIVITIES

### A. ECOSYSTEMS MANAGEMENT:

#### 1. Vegetation:

Stand is of wind origin in understory reinitiation stage.

#### 2. Aquatic Habitat:

No Class I/II streams in Unit.

No Class III streams in Unit.

#### 3. Wildlife Habitat:

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 1500 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.

#### 4. Visuals:

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets modification VQO as designed.

### B. TRANSPORTATION SYSTEM:

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing in 400-49.

### C. SILVICULTURAL PRESCRIPTION SUMMARY:

Evenage Clearcut with 15% retention of large wildlife legacy trees using helicopter yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

### D. UNIT DESIGN:

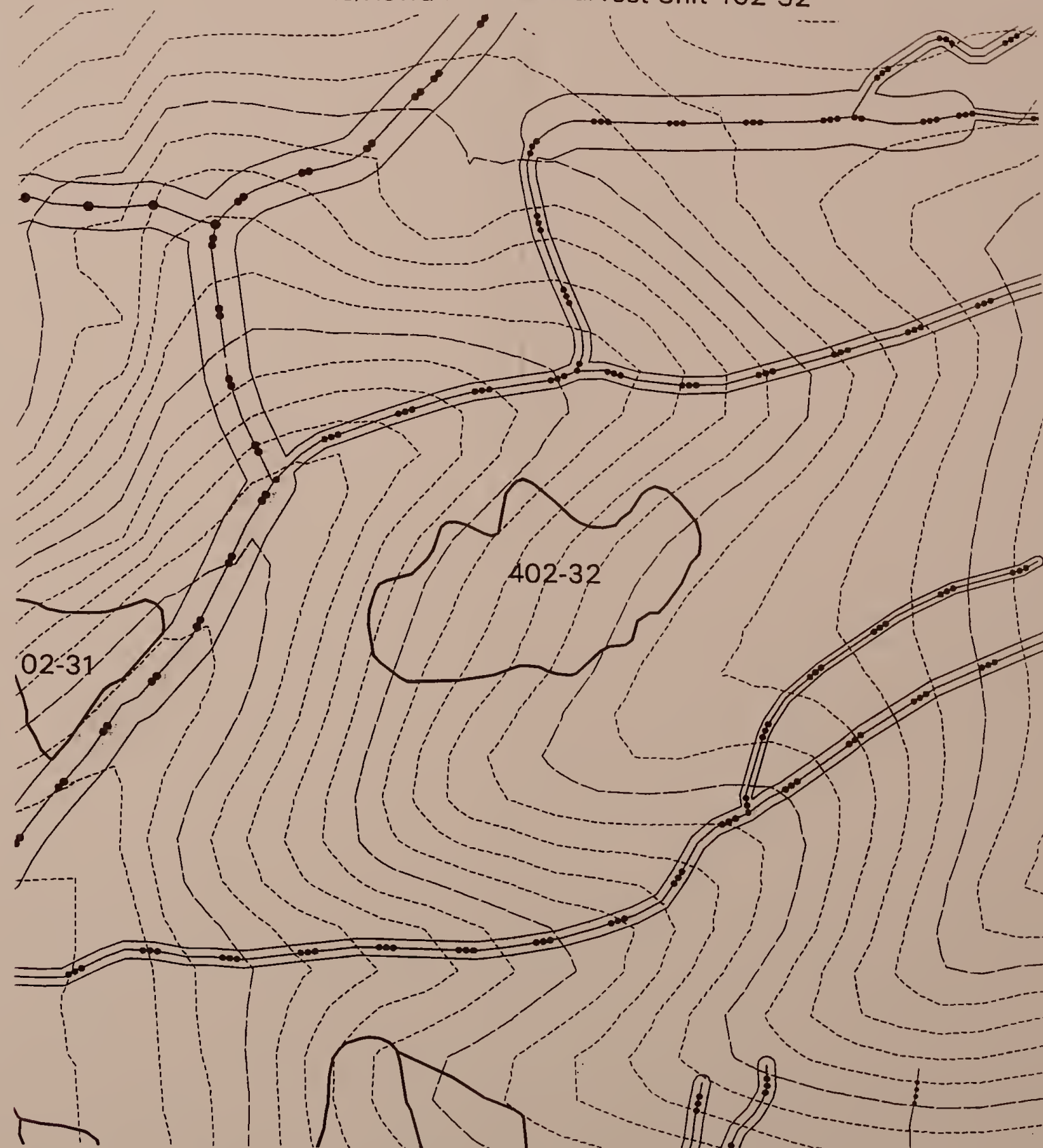
The small size and irregular boundary helps the unit blend with patterns found in the characteristic landscape.

Full suspension required to protect unstable soils.

Unit is located on leeward side of ridge to protect it from winds.

Unit designed for helicopter yarding.

## Crane/Rowan Timber Harvest Unit 402-32



- Proposed Unit Boundaries
- Non-NF Lands
- Existing and Planned Managed Stands
- Riparian Management Area
- AHMU-Class 1 Streams
- AHMU-Class 2 Streams
- AHMU-Class 3 Streams
- AHMU-Class 4 Streams

- Existing Forest Development Roads
- Existing Closed Roads
- Proposed Forest Development Roads
- Proposed Temporary Roads
- 500-ft. Contour Interval
- 100-ft. Contour Interval

0 660 1320  
Scale is 1 inch = 660 feet



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-32.2

Management Prescription: **Timber Production**

Acres Even Aged: 22

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 0

Desired Future Condition **Even aged**

Acres Uneven Aged 0

Volume(MBF) 739.2

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77 Flight# **3A** Photo# 7

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit visible from saltwater - meet VQO of Partial Retention.  
Moderately unstable soils in entire unit - maintain soil stability.  
South winds predominate - incorporate disturbance ecology principles.  
No streams in unit.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is of wind origin in understory reinitiation stage.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

No Class III streams in Unit.

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets modification VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing in 400-49.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Evenage Clearcut with 15% retention of large wildlife legacy trees using helicopter yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

#### **D. UNIT DESIGN:**

The small size and irregular boundary helps the unit blend with patterns found in the characteristic landscape.

Full suspension required to protect unstable soils.

Unit is located on leeward side of ridge to protect it from winds.

Unit designed for helicopter yarding.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-32.3

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 22

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 418

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77 Flight# 3A Photo# 7

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit visible from saltwater - meet VQO of Partial Retention.

Moderately unstable soils in entire unit - maintain soil stability.

South winds predominate - incorporate disturbance ecology principles.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

No streams in unit.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is of wind origin in understory reinitiation stage.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

No Class III streams in Unit.

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing in 400-49.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

The small size and irregular boundary helps the unit blend with patterns found in the characteristic landscape.

Full suspension required to protect unstable soils.

Unit is located on leeward side of ridge to protect it from winds.

Unit designed for helicopter yarding.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-32.4

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 22

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 418

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77 Flight# 3A Photo# 7

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit visible from saltwater - meet VQO of Partial Retention.

Moderately unstable soils in entire unit - maintain soil stability.

South winds predominate - incorporate disturbance ecology principles.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

No streams in unit.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is of wind origin in understory reinitiation stage.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

No Class III streams in Unit.

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing in 400-49.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and plant 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

The small size and irregular boundary helps the unit blend with patterns found in the characteristic landscape.

Full suspension required to protect unstable soils.

Unit is located on leeward side of ridge to protect it from winds.

Unit designed for helicopter yarding.



VCU-UNIT.ALT 402-49.5

Management Prescription: Timber Production

Natural Stand Condition: Old Growth

Desired Future Condition: Even aged

Acres Even Aged: 15

Acres 2-Aged: 0

Acres Uneven Aged: 0

Volume(MBF) 504

Aerial Photo: 77 Flight# 3A Photo# 8

USGS 1/4 QUAD MAP #: PTA C2 NE

## RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit located near beach - maintain beach fringe habitat.  
Estuary habitat south of unit - maintain wildlife habitat.  
Unit is seen from saltwater - meet VQO of Modification.  
Southerly winds predominate - incorporate disturbance ecology principles.  
No streams in unit.

## IMPLEMENTATION ACTIVITIES

### A. ECOSYSTEMS MANAGEMENT:

#### 1. Vegetation:

Stand has no apparent cohorts. Average site.

#### 2. Aquatic Habitat:

No Class I/II streams in Unit.

No Class III streams in Unit.

#### 3. Wildlife Habitat:

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 500 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.

#### 4. Visuals:

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

### B. TRANSPORTATION SYSTEM:

The temporary spur continuing on from 402-28 ends at the landing for the northern cable setting (402-49b). The landing for this unit will also serve helicopter units 402-30,31,32 &50. All drainage structures will be removed from the temporary spur to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

### C. SILVICULTURAL PRESCRIPTION SUMMARY:

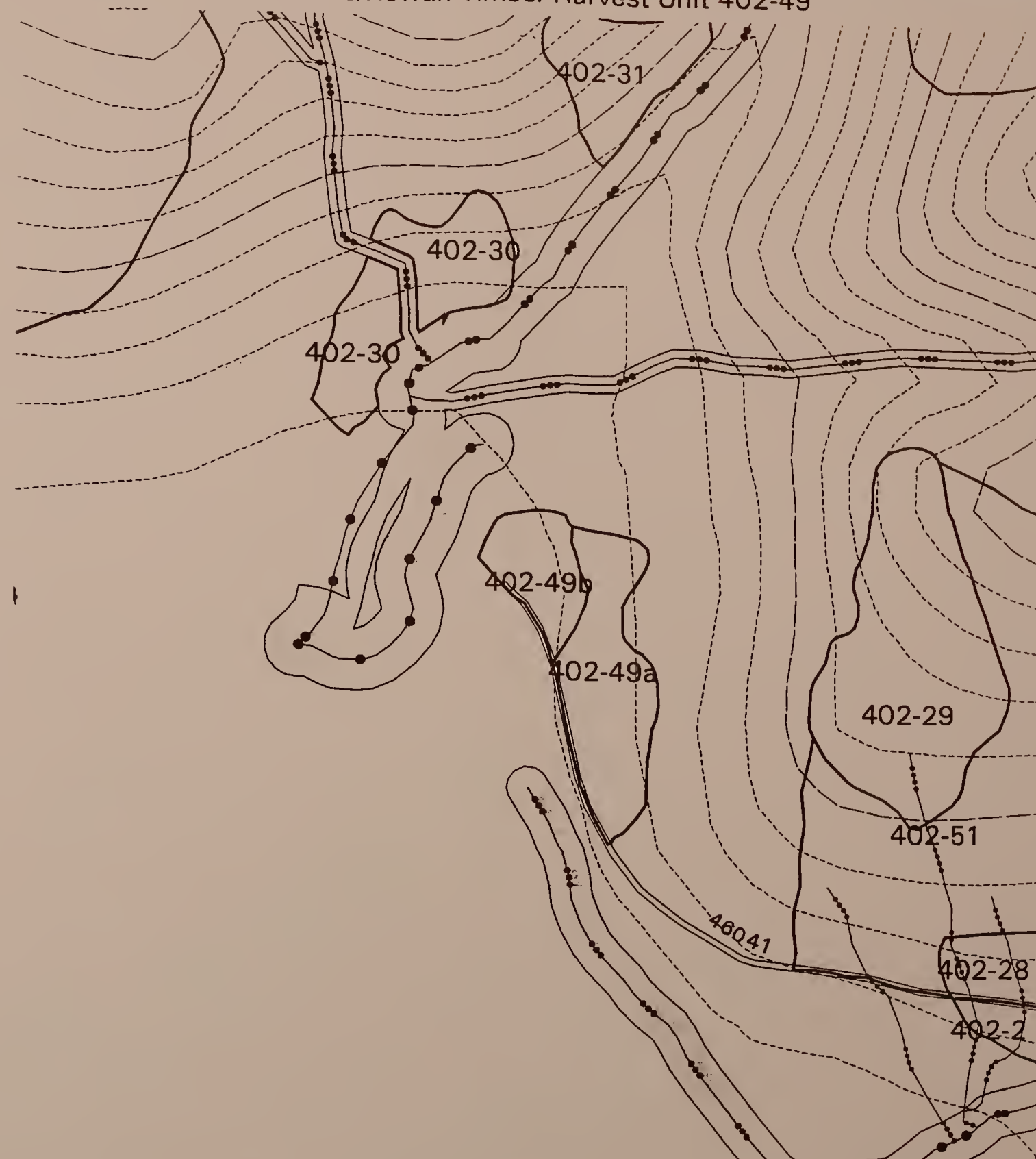
(a) is Evenaged Clearcut with 15% retention of large wildlife legacy trees using downhill cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. (b) is same as (a) with uphill cable yarding.

### D. UNIT DESIGN:

Maintain irregular backline to meet visual objectives.

Northern boundary adjacent to landslide provides protection from windthrow.

## Crane/Rowan Timber Harvest Unit 402-49



Proposed Unit Boundaries  
Non-NF Lands  
Existing and Planned Managed Stands  
Riparian Management Area  
AHMU-Class 1 Streams  
AHMU-Class 2 Streams  
AHMU-Class 3 Streams  
AHMU-Class 4 Streams

Existing Forest Development Roads  
Existing Closed Roads  
Proposed Forest Development Roads  
Proposed Temporary Roads  
500-ft. Contour Interval  
100-ft. Contour Interval

0 660 1320  
Scale is 1 inch = 660 feet



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT 402-49.2**

Management Prescription: **Timber Production**

Acres Even Aged: **15**

Natural Stand Condition: **Old Growth**

Acres 2-Aged: **0**

Desired Future Condition: **Even aged**

Acres Uneven Aged **0**

Volume(MBF) **504**

USGS 1/4 QUAD MAP #: **PTA C2 NE**

Aerial Photo: **77**

Flight# **3A**

Photo# **8**

### **I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

Unit located near beach - maintain beach fringe habitat.  
Estuary habitat south of unit - maintain wildlife habitat.  
Unit is seen from saltwater - meet VQO of Modification.  
Southerly winds predominate - incorporate disturbance ecology principles.  
No streams in unit.

### **II. IMPLEMENTATION ACTIVITIES**

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand has no apparent cohorts. Average site.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

No Class III streams in Unit.

##### **3. Wildlife Habitat:**

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 500 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

The temporary spur continuing on from 402-28 ends at the landing for the northern cable setting (402-49b). The landing for this unit will also serve helicopter units 402-30,31,32 &50. All drainage structures will be removed from the temporary spur to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) is Evenaged Clearcut with 15% retention of large wildlife legacy trees using downhill cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. (b) is same as (a) with uphill cable yarding.

#### **D. UNIT DESIGN:**

Maintain irregular backline to meet visual objectives.

Northern boundary adjacent to landslide provides protection from windthrow.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-49.3

Management Prescription: **Timber Production**

Acres Even Aged: 10

Natural Stand Condition: **Old Growth**

Acres 2-Aged: 5

Desired Future Condition **Even aged, 2-aged mixture**

Acres Uneven Aged 0

Volume(MBF) 431

USGS 1/4 QUAD MAP #: **PTA C2 NE**

Aerial Photo: 77

Flight# 3A

Photo#

8

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit located near beach - maintain beach fringe habitat.  
Estuary habitat south of unit - maintain wildlife habitat.  
Unit is seen from saltwater - meet VQO of Modification.  
Southerly winds predominate -incorporate disturbance ecology principles.  
Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.  
No streams in unit.

### II. IMPLEMENTATION ACTIVITIES

#### A. ECOSYSTEMS MANAGEMENT:

##### 1. Vegetation:

Stand has no apparent cohorts. Average site.

##### 2. Aquatic Habitat:

No Class I/II streams in Unit.

No Class III streams in Unit.

##### 3. Wildlife Habitat:

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 500 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management. Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Part of the unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### 4. Visuals:

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### B. TRANSPORTATION SYSTEM:

The temporary spur continuing on from 402-28 ends at the landing for the northern cable setting (402-49b). The landing for this unit will also serve helicopter units 402-30,31,32 &50. All drainage structures will be removed from the temporary spur to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### C. SILVICULTURAL PRESCRIPTION SUMMARY:

(a) is Clearcut with 15% retention of large wildlife legacy trees using downhill cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. (b) is 2-aged Seedtree with reserves (upper and lower diameter limit Rx for hemlock and cedar, paint for reserve 1 large spruce every 10 acres) using uphill running skyline cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### D. UNIT DESIGN:

Maintain irregular backline to meet visual objectives.

Northern boundary adjacent to landslide provides protection from windthrow.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-49.4

Acres Even Aged: 10

Management Prescription: **Timber Production**

Acres 2-Aged: 5

Natural Stand Condition: **Old Growth**

Acres Uneven Aged 0

Desired Future Condition **Even aged, 2-aged mixture**

Volume(MBF) 431

USGS 1/4 QUAD MAP #: **PTA C2 NE**

Aerial Photo: 77

Flight# 3A

Photo# 8

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit located near beach - maintain beach fringe habitat.  
Estuary habitat south of unit - maintain wildlife habitat.  
Unit is seen from saltwater - meet VQO of Modification.  
Southerly winds predominate - incorporate disturbance ecology principles.  
Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.  
No streams in unit.

### II. IMPLEMENTATION ACTIVITIES

#### A. ECOSYSTEMS MANAGEMENT:

##### **1. Vegetation:**

Stand has no apparent cohorts. Average site.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

No Class III streams in Unit.

##### **3. Wildlife Habitat:**

Unit is in high deer HSI value and high Marten HIS value. South facing slope below 500 feet in elevation. Reserve trees will be retained in all alternatives that prescribe even-aged management. Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Part of the unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### B. TRANSPORTATION SYSTEM:

The temporary spur continuing on from 402-28 ends at the landing for the northern cable setting (402-49b). The landing for this unit will also serve helicopter units 402-30,31,32 & 50. All drainage structures will be removed from the temporary spur to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### C. SILVICULTURAL PRESCRIPTION SUMMARY:

(a) is Clearcut with 15% retention of large wildlife legacy trees using downhill cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. (b) is 2-aged Seedtree with reserves (upper and lower diameter limit Rx for hemlock and cedar, paint for reserve 1 large spruce every 10 acres) using uphill running skyline cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow.

#### D. UNIT DESIGN:

Maintain irregular backline to meet visual objectives.

Northern boundary adjacent to landslide provides protection from windthrow.



VQU-UNIT.ALT

402-50.5

Management Prescription: Timber Production

Natural Stand Condition: Understory Reinitiation

Desired Future Condition 2-aged

Acres Even Aged: 0

Acres 2-Aged: 106

Acres Uneven Aged 0

Volume(MBF) 2014

Aerial Photo: 0

Flight#

Photo# 0

USGS 1/4 QUAD MAP #:

RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

Two Class III streams in unit.

Unit is seen from saltwater - meet VQO of Modification.

IMPLEMENTATION ACTIVITIES

A. ECOSYSTEMS MANAGEMENT:

1. Vegetation:

Stand is understory reinitiation. Dense stand with good spruce component.

2. Aquatic Habitat:

No Class I/II streams in Unit.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Both streams are in the High Gradient Contained Process Group. Manage the area with 120 feet of the top of the V-notch to provide for windfirmness. The 2-aged treatment is expected to meet the needs of providing windfirmness. South winds predominate.

3. Wildlife Habitat:

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

4. Visuals:

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

B. TRANSPORTATION SYSTEM:

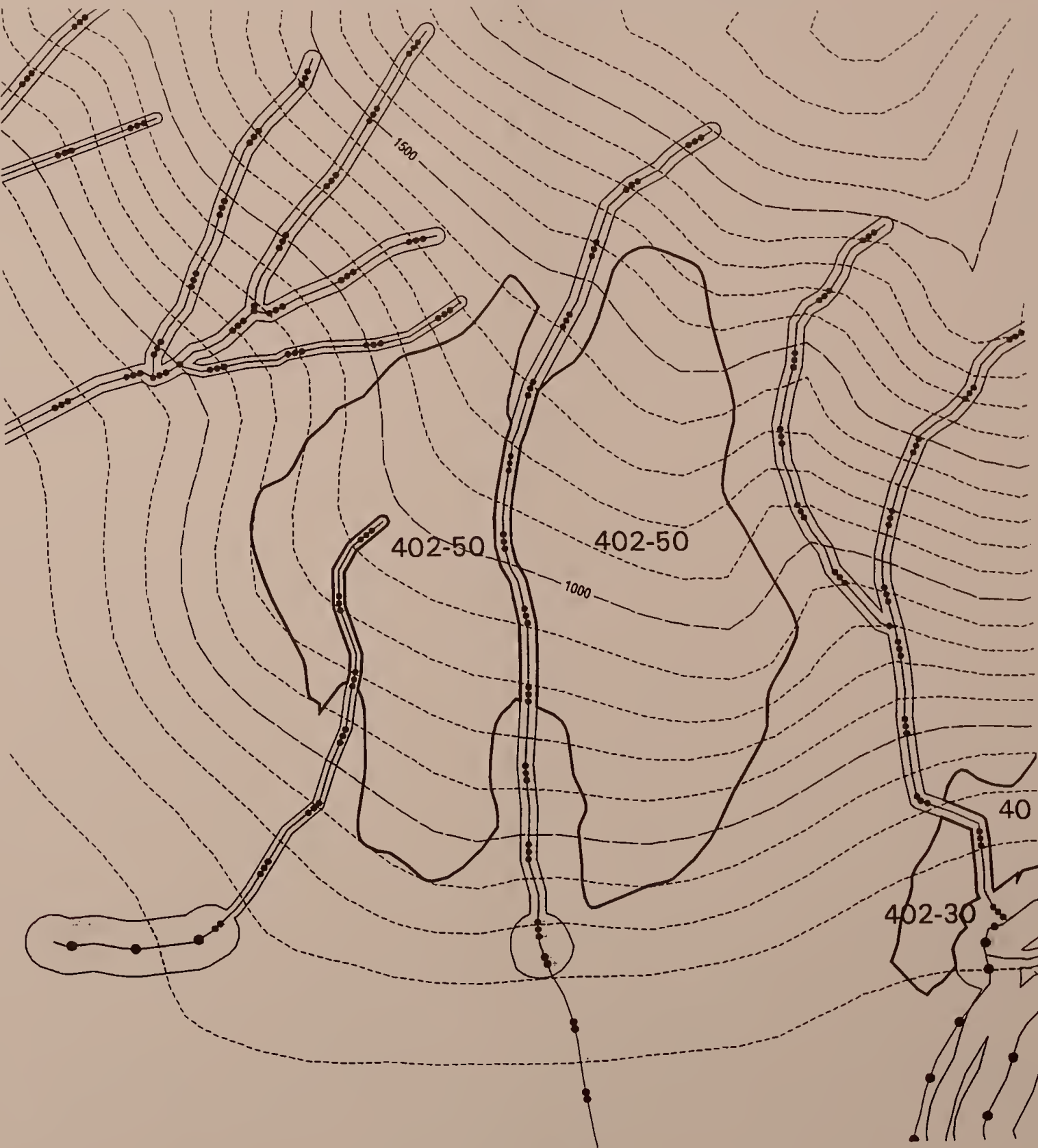
Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing in 400-49.

C. SILVICULTURAL PRESCRIPTION SUMMARY:

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and plant 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts;1) Young trees from regeneration harvest 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

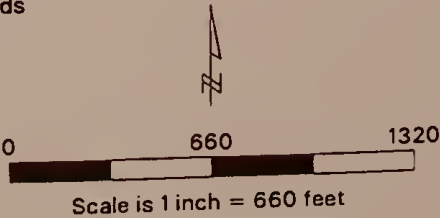
D. UNIT DESIGN:

Crane/Rowan Timber Harvest Unit 402-50



- Proposed Unit Boundaries
- Non-NF Lands
- Existing and Planned Managed Stands
- Riparian Management Area
- AHMu-Class 1 Streams
- AHMu-Class 2 Streams
- AHMu-Class 3 Streams
- AHMu-Class 4 Streams

- Existing Forest Development Roads
- Existing Closed Roads
- Proposed Forest Development Roads
- Proposed Temporary Roads
- 500-ft. Contour Interval
- 100-ft. Contour Interval





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-50.2

Management Prescription: **Timber Production**

Natural Stand Condition:

Desired Future Condition

Acres Even Aged: 0

Acres 2-Aged: 0

Acres Uneven Aged 0

Volume(MBF) 0

USGS 1/4 QUAD MAP #:

Aerial Photo: 0

Flight#

Photo#

0

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit not in this alternative.

### II. IMPLEMENTATION ACTIVITIES

#### A. ECOSYSTEMS MANAGEMENT:

1. Vegetation:

2. Aquatic Habitat:

3. Wildlife Habitat:

4. Visuals:

#### B. TRANSPORTATION SYSTEM:

#### C. SILVICULTURAL PRESCRIPTION SUMMARY:

#### D. UNIT DESIGN:



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-50.3

Management Prescription: **Timber Production**

Natural Stand Condition:

Desired Future Condition

Acres Even Aged: 0

Acres 2-Aged: 0

Acres Uneven Aged 0

Volume(MBF) 0

USGS 1/4 QUAD MAP #:

Aerial Photo: 0

Flight#

Photo#

0

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit not in this alternative.

### II. IMPLEMENTATION ACTIVITIES

#### A. ECOSYSTEMS MANAGEMENT:

1. Vegetation:

2. Aquatic Habitat:

3. Wildlife Habitat:

4. Visuals:

#### B. TRANSPORTATION SYSTEM:

#### C. SILVICULTURAL PRESCRIPTION SUMMARY:

#### D. UNIT DESIGN:



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-50.4

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 106

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 2014

USGS 1/4 QUAD MAP #:

Aerial Photo: 0

Flight#

Photo#

0

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription..

Two Class III streams in unit.

Unit is seen from saltwater - meet VQO of Modification.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is understory reinitiation. Dense stand with good spruce component.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Both streams are in the High Gradient Contained Process Group. Manage the area with 120 feet of the top of the V-notch to provide for windfirmness. The 2-aged treatment is expected to meet the needs of providing windfirmness. South winds predominate.

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Unit is not accessible by road due to steep topography. Planned helicopter unit will use landing in 400-49.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and plant 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**



VCU-UNIT.ALT	402-51.5				
Management Prescription:	Timber Production	Acres Even Aged:	0		
Natural Stand Condition:	Understory Reinitiation	Acres 2-Aged:	35		
Desired Future Condition	2-aged	Acres Uneven Aged	0		
		Volume(MBF)	665		
USGS 1/4 QUAD MAP #:	PTA C1 NW	Aerial Photo:	77	Flight#	3A
		Photo#	8		

RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Access "difficult" component of the ASQ - develop techniques for managing this component.  
Unit is seen from Rowan Bay - meet VQO of Modification.  
Southeast winds predominate - incorporate disturbance ecology principles.  
Several Class IV streams extend up into unit.  
Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

II. IMPLEMENTATION ACTIVITIES

A. ECOSYSTEMS MANAGEMENT:

1. Vegetation:  
Stand is understory reinitiation. Lower portion is multi-cohort, upper portion is 340 year old even aged dense stand with good spruce component. Small patch of 95 year old windthrow within stand. (from SE).
2. Aquatic Habitat:  
No Class I/II streams in Unit.  
No Class III streams in Unit.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream.  
Partially suspend logs over the stream. ( BMP13.16 Stream Channel Protection)

3. Wildlife Habitat:  
Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.
4. Visuals:  
Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

B. TRANSPORTATION SYSTEM:

Most of this unit is not accessible by road due to steep topography. The partial harvest prescription will be most easily accomplished by helicopter yarding. The temporary spur that runs along the bottom of this unit is available if the timber sale operator wants to try some downhill cable partial cutting. Planned helicopter unit will use landing in 402-28.

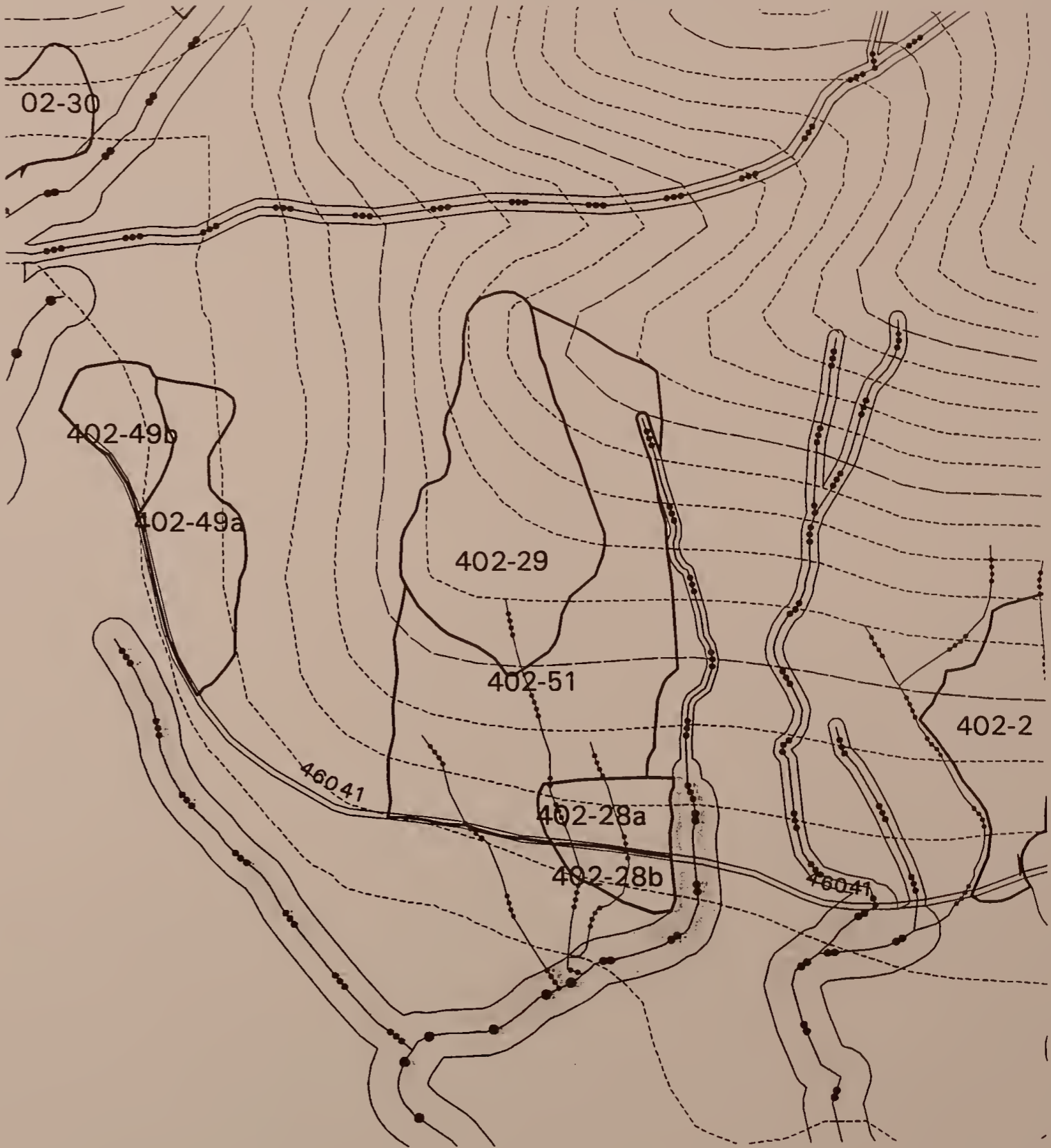
C. SILVICULTURAL PRESCRIPTION SUMMARY:

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and plant 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts;1) Young trees from regeneration harvest 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

D. UNIT DESIGN:

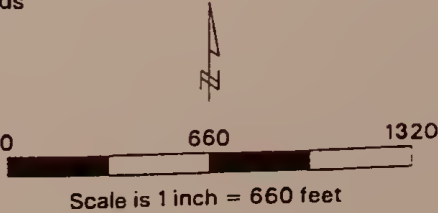
Multi-entry plan for this hillside is to progressively harvest units into the wind.  
Northwest boundary of unit located on leeward side of ridge to afford topographic protection from southeast winds.  
Unit designed for helicopter yarding.

Crane/Rowan Timber Harvest Unit 402-51



- Proposed Unit Boundaries
- Non-NF Lands
- Existing and Planned Managed Stands
- Riparian Management Area
- AHMU-Class 1 Streams
- AHMU-Class 2 Streams
- AHMU-Class 3 Streams
- AHMU-Class 4 Streams

- Existing Forest Development Roads
- Existing Closed Roads
- Proposed Forest Development Roads
- Proposed Temporary Roads
- 500-ft. Contour Interval
- 100-ft. Contour Interval





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-51.2

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 0

Desired Future Condition

Acres Uneven Aged 0

Volume(MBF) 0

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77 Flight# 3A Photo# 8

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Unit not in this alternative.

### II. IMPLEMENTATION ACTIVITIES

#### A. ECOSYSTEMS MANAGEMENT:

1. Vegetation:

2. Aquatic Habitat:

3. Wildlife Habitat:

4. Visuals:

#### B. TRANSPORTATION SYSTEM:

#### C. SILVICULTURAL PRESCRIPTION SUMMARY:

#### D. UNIT DESIGN:



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-51.3

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 0

Desired Future Condition

Acres Uneven Aged 0

Volume(MBF) 0

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: **77** Flight# **3A** Photo# **8**

### **I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

Unit not in this alternative.

### **II. IMPLEMENTATION ACTIVITIES**

#### **A. ECOSYSTEMS MANAGEMENT:**

1. **Vegetation:**

2. **Aquatic Habitat:**

3. **Wildlife Habitat:**

4. **Visuals:**

#### **B. TRANSPORTATION SYSTEM:**

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

#### **D. UNIT DESIGN:**



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 402-51.4

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 35

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 665

USGS 1/4 QUAD MAP #: **PTA C1 NW**

Aerial Photo: 77

Flight# **3A** Photo# 8

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Access "difficult" component of the ASQ - develop techniques for managing this component.

Unit is seen from Rowan Bay - meet VQO of Modification.

Southeast winds predominate - incorporate disturbance ecology principles.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

Several Class IV streams extend up into unit.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is understory reinitiation. Lower portion is multi-cohort, upper portion is 340 year old even aged dense stand with good spruce component. Small patch of 95 year old windthrow within stand. (from SE).

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

No Class III streams in Unit.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream.( BMP13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

Unit is within the Rowan Peak viewshed and is part of a long range multi-entry harvest scheme designed to work with natural features found in the landscape. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Most of this unit is not accessible by road due to steep topography. The partial harvest prescription will be most easily accomplished by helicopter yarding. The temporary spur that runs along the bottom of this unit is available if the timber sale operator wants to try some downhill cable partial cutting. Planned helicopter unit will use landing in 402-28.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using helicopter yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

Multi-entry plan for this hillside is to progressively harvest units into the wind.

Northwest boundary of unit located on leeward side of ridge to afford topographic protection from southeast winds.

Unit designed for helicopter yarding.



# CRANE and ROWAN MOUNTAIN UNIT PLAN

VCU-UNIT.ALT

420-46.5

Management Prescription: Timber Production

Natural Stand Condition: Old Growth

Desired Future Condition Even aged

Acres Even Aged: 38

Acres 2-Aged: 0

Acres Uneven Aged 0

Volume(MBF) 1276.8

Aerial Photo: 77 Flight# 13 Photo# 51

USGS 1/4 QUAD MAP #: PBG C6 NW

## RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class III stream in unit.  
Two Class IV streams in unit.  
South winds predominate -- incorporate disturbance ecology principles.  
Area of incompetent, highly fractured, volcanoclastic rock in area -- avoid these areas.  
Area visible from Port Camden -- meet modification VQO.

## IMPLEMENTATION ACTIVITIES

### A. ECOSYSTEMS MANAGEMENT:

#### 1. Vegetation:

Old Growth stand with no apparent cohort. Average site.

#### 2. Aquatic Habitat:

No Class I/II streams in Unit.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The Class III stream is in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch to provide for windfirmness. Pay special attention to the south side of the stream which will be exposed to SE winds.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream.( BMP13.16 Stream Channel Protection)

#### 3. Wildlife Habitat:

Unit is in medium deer HSI value and high Marten HIS value. South facing slope below 1000 feet in elevation.

#### 4. Visuals:

Landscape viewed in the middle-ground from Port Camden. Past harvest activities are evident, yet work with features found in the characteristic landscape. Unit falls within the west Port Camden viewshed, future activities are designed to be consistent with the existing harvest patterns. Unit meets modification VQO as designed.

### B. TRANSPORTATION SYSTEM:

Specified road 46360 runs through this unit. This road will be put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

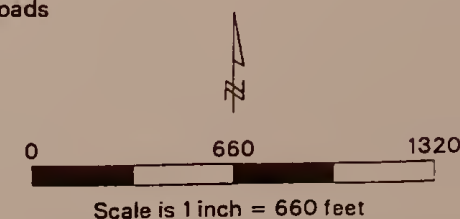
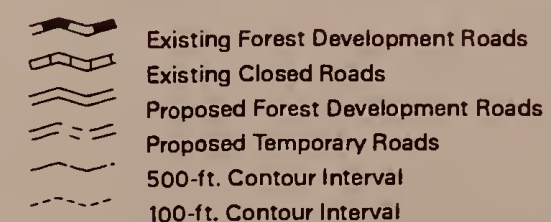
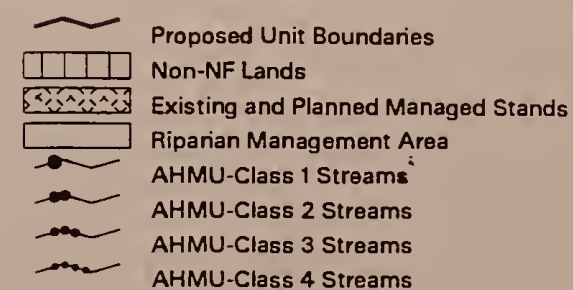
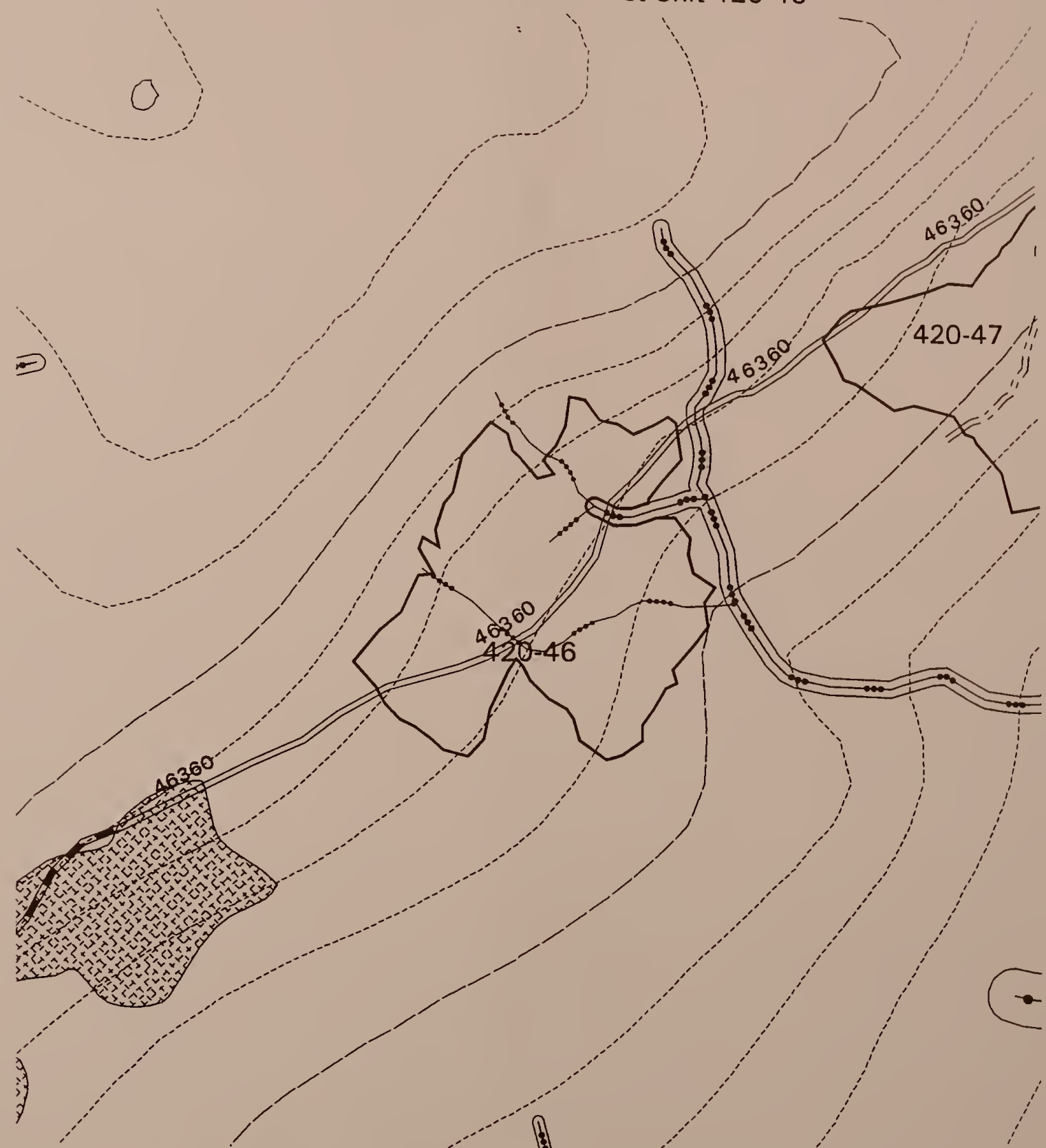
### C. SILVICULTURAL PRESCRIPTION SUMMARY:

Evenage Clearcut using cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

### D. UNIT DESIGN:

Unit avoids area of highly fractured bedrock. Partial suspension is required for soils protection. Upper backline is on steeper slopes where timber has developed a natural windfirmness due to topographic relation to the prevailing winds. Irregular boundaries and relationship to topographic features will ensure meeting the visual objectives.

## Crane/Rowan Timber Harvest Unit 420-46





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT 420-46.2**

Management Prescription: **Timber Production**

Acres Even Aged: 38

Natural Stand Condition: **Old Growth**

Acres 2-Aged: 0

Desired Future Condition **Even aged**

Acres Uneven Aged 0

Volume(MBF) 1276.8

USGS 1/4 QUAD MAP #: **PBG C6 NW**

Aerial Photo: 77

Flight# 13 Photo# 51

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class III stream in unit.  
Two Class IV streams in unit.  
South winds predominate -- incorporate disturbance ecology principles.  
Area of incompetent, highly fractured, volcaniclastic rock in area -- avoid these areas.  
Area visible from Port Camden -- meet modification VQO.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Old Growth stand with no apparent cohort. Average site.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The Class III stream is in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch to provide for windfirmness. Pay special attention to the south side of the stream which will be exposed to SE winds.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream.( BMP13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Unit is in medium deer HSI value and high Marten HIS value. South facing slope below 1000 feet in elevation.

##### **4. Visuals:**

Landscape viewed in the middle-ground from Port Camden. Past harvest activities are evident, yet work with features found in the characteristic landscape. Unit falls within the west Port Camden viewshed, future activities are designed to be consistent with the existing harvest patterns. Unit meets modification VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46360 runs through this unit. This road will be put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Evenage Clearcut using cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

#### **D. UNIT DESIGN:**

Unit avoids area of highly fractured bedrock. Partial suspension is required for soils protection. Upper backline is on steeper slopes where timber has developed a natural windfirmness due to topographic relation to the prevailing winds. Irregular boundaries and relationship to topographic features will ensure meeting the visual objectives.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT 420-46.3**

Acres Even Aged: 0

Management Prescription: **Timber Production**

Acres 2-Aged: 38

Natural Stand Condition: **Old Growth**

Acres Uneven Aged 0

Desired Future Condition **2-aged**

Volume(MBF) 722

USGS 1/4 QUAD MAP #: **PBG C6 NW**

Aerial Photo: 77

Flight# 13

Photo# 51

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class III stream in unit.

Two Class IV streams in unit.

South winds predominate -- incorporate disturbance ecology principles.

Area of incompetent, highly fractured, volcanoclastic rock in area -- avoid these areas.

Area visible from Port Camden -- meet modification VQO.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is average site with no apparent cohorts.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The Class III stream is in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch to provide for windfirmness. Pay special attention to the south side of the stream which will be exposed to SE winds.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure to provide necessary habitat characteristics for forest dwelling species. Entire unit will be harvested using an alternative silvicultural prescription (See below). This should exceed the TLMP Standards and Guidelines for the entire the unit.

##### **4. Visuals:**

Landscape viewed in the middle-ground from Port Camden. Past harvest activities are evident, yet work with features found in the characteristic landscape. Unit falls within the west Port Camden viewshed, future activities are designed to be consistent with the existing harvest patterns. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46360 runs through this unit. This road will be put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using cable yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and plant 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow.

#### **D. UNIT DESIGN:**

Unit avoids area of highly fractured bedrock. Partial suspension is required for soils protection. Upper backline is on steeper slopes where timber has developed a natural windfirmness due to topographic relation to the prevailing winds. Irregular boundaries and relationship to topographic features will ensure meeting the visual objectives.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 420-46.4

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Old Growth**

Acres 2-Aged: 38

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 722

USGS 1/4 QUAD MAP #: **PBG C6 NW**

Aerial Photo: 77 Flight# 13 Photo# 51

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class III stream in unit.

Two Class IV streams in unit.

South winds predominate -- incorporate disturbance ecology principles.

Area of incompetent, highly fractured, volcanoclastic rock in area -- avoid these areas.

Area visible from Port Camden -- meet modification VQO.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is average site with no apparent cohorts.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The Class III stream is in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch to provide for windfirmness. Pay special attention to the south side of the stream which will be exposed to SE winds.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure to provide necessary habitat characteristics for forest dwelling species. Entire unit will be harvested using an alternative silvicultural prescription (See below). This should exceed the TLMP Standards and Guidelines for the entire the unit.

##### **4. Visuals:**

Landscape viewed in the middle-ground from Port Camden. Past harvest activities are evident, yet work with features found in the characteristic landscape. Unit falls within the west Port Camden viewshed, future activities are designed to be consistent with the existing harvest patterns. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46360 runs through this unit. This road will be put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using cable yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow.

#### **D. UNIT DESIGN:**

Unit avoids area of highly fractured bedrock. Partial suspension is required for soils protection. Upper backline is on steeper slopes where timber has developed a natural windfirmness due to topographic relation to the prevailing winds. Irregular boundaries and relationship to topographic features will ensure meeting the visual objectives.



VCU-UNIT.ALT

420-47.5

Management Prescription: Timber Production  
Natural Stand Condition: Understory Reinitiation  
Desired Future Condition: Even aged

Acres Even Aged: 27

Acres 2-Aged: 0

Acres Uneven Aged: 0

Volume(MBF) 907.2

Aerial Photo: 77 Flight# 13 Photo# 51

USGS 1/4 QUAD MAP #: PBG C6 NW

RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

South winds predominate -- incorporate disturbance ecology principles.  
Area of incompetent, highly fractured, volcanoclastic rock in area -- avoid these areas.  
Unit is seen from saltwater -- meet VQO of modification.  
No streams in unit.

IMPLEMENTATION ACTIVITIES

A. ECOSYSTEMS MANAGEMENT:

1. Vegetation:  
Stand is multi cohort with area of early understory reinitiation (160 years) with scattered large residuals.

2. Aquatic Habitat:  
No Class I/II streams in Unit.  
No Class III streams in Unit.

3. Wildlife Habitat:  
Unit is in medium deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation.

4. Visuals:  
Landscape viewed in the middle-ground from Port Camden. Past harvest activities are evident, yet work with features found in the characteristic landscape. Unit falls within the west Port Camden viewshed, future activities are designed to be consistent with the existing harvest patterns. Unit meets modification VQO as designed.

B. TRANSPORTATION SYSTEM:

Specified road 46360 runs along the top of the unit. A temporary spur runs down to the edge of a bench overlooking the lower portion of the unit. The spur will be obliterated and the specified road put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

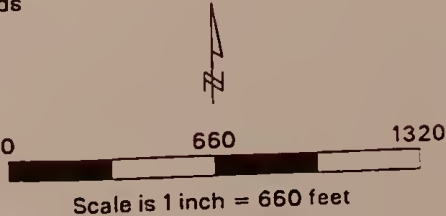
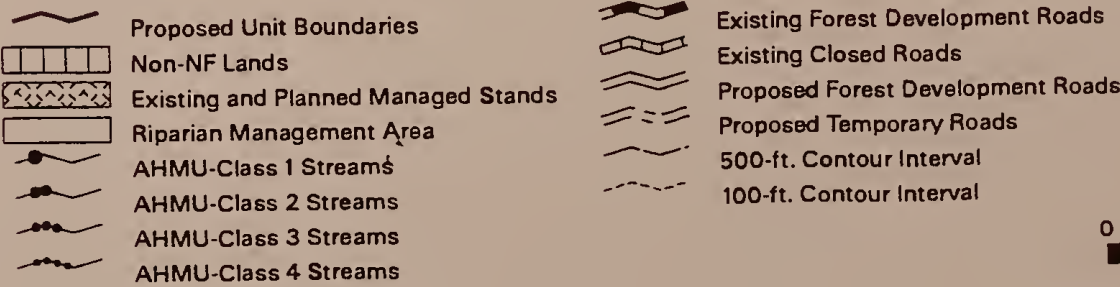
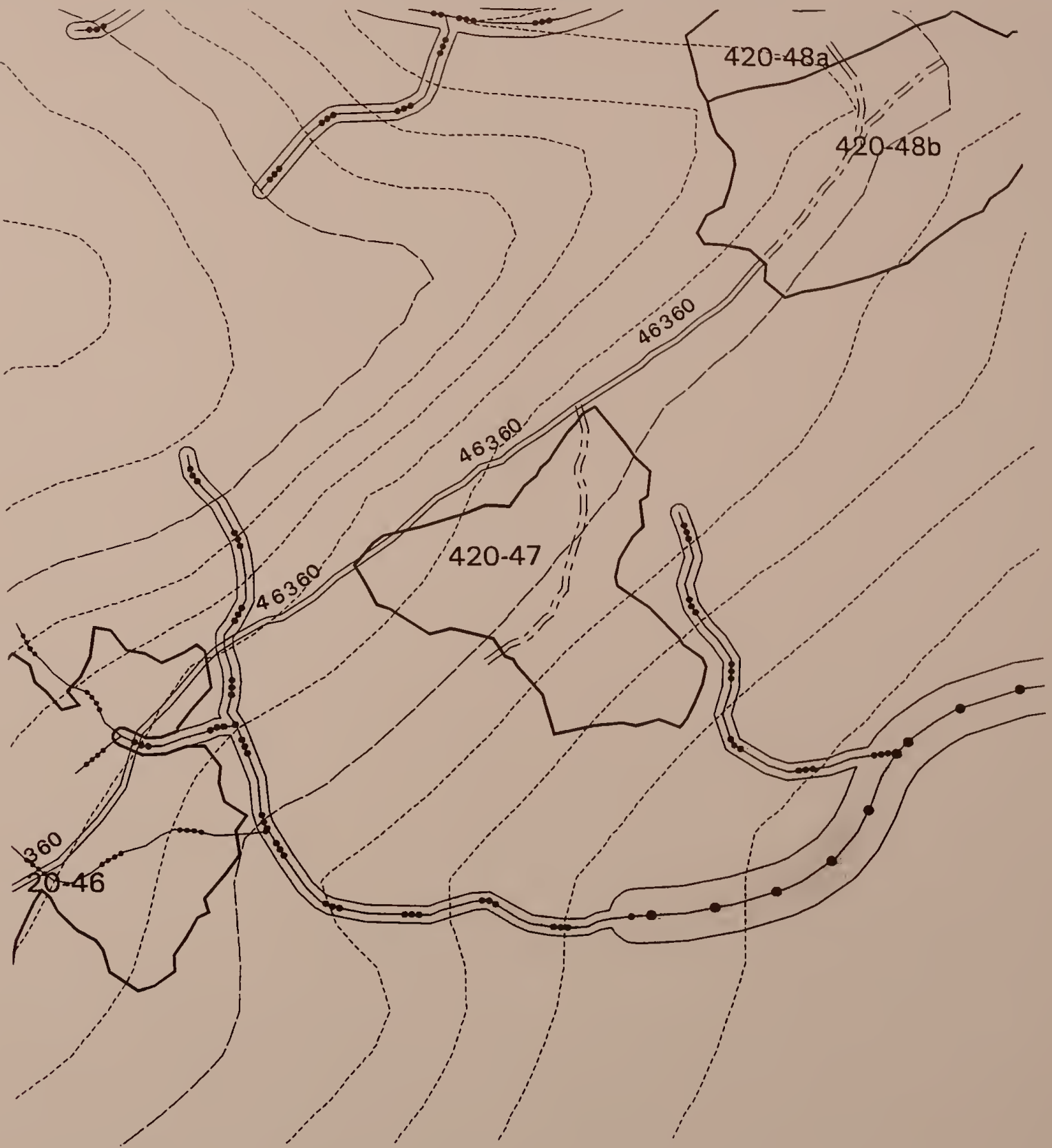
C. SILVICULTURAL PRESCRIPTION SUMMARY:

Evenage Clearcut using cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

D. UNIT DESIGN:

Unit avoids are of highly fractured bedrock. Partial suspension is required in unit to protect soils. Upper backline is on steeper slopes where timber has developed a natural windfirmness due to topographic relation to the prevailing winds. Northern boundary takes advantage of muskeg to minimize risk of blowdown. Unit shaped to minimize apparent size and work with topographic features found in the landscape.

Crane/Rowan Timber Harvest Unit 420-47





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 420-47.2

Management Prescription: **Timber Production**

Acres Even Aged: 27

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 0

Desired Future Condition **Even aged**

Acres Uneven Aged 0

Volume(MBF) 907.2

USGS 1/4 QUAD MAP #: **PBG C6 NW**

Aerial Photo: 77 Flight# 13 Photo# 51

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

South winds predominate -- incorporate disturbance ecology principles.

Area of incompetent, highly fractured, volcanoclastic rock in area -- avoid these areas.

Unit is seen from saltwater -- meet VQO of modification.

No streams in unit.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is multi cohort with area of early understory reinitiation (160 years) with scattered large residuals.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

No Class III streams in Unit.

##### **3. Wildlife Habitat:**

Unit is in medium deer HSI value and high Marten HIS value. South facing slope below 800 feet in elevation.

##### **4. Visuals:**

Landscape viewed in the middle-ground from Port Camden. Past harvest activities are evident, yet work with features found in the characteristic landscape. Unit falls within the west Port Camden viewshed, future activities are designed to be consistent with the existing harvest patterns. Unit meets modification VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46360 runs along the top of the unit. A temporary spur runs down to the edge of a bench overlooking the lower portion of the unit. The spur will be obliterated and the specified road put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Evenage Clearcut using cable yarding system, certify natural regeneration, pre-commercial thin to maintain healthy stand.

#### **D. UNIT DESIGN:**

Unit avoids areas of highly fractured bedrock. Partial suspension is required in unit to protect soils. Upper backline is on steeper slopes where timber has developed a natural windfirmness due to topographic relation to the prevailing winds. Northern boundary takes advantage of muskeg to minimize risk of blowdown. Unit shaped to minimize apparent size and work with topographic features found in the landscape.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 420-47.3

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 27

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 513

USGS 1/4 QUAD MAP #: **PBG C6 NW**

Aerial Photo: 77

Flight# 13

Photo# 51

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

South winds predominate -- incorporate disturbance ecology principles.

Area of incompetent, highly fractured, volcaniclastic rock in area -- avoid these areas.

Unit is seen from saltwater -- meet VQO of modification.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

No streams in unit.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is multi cohort with area of early understory reinitiation (160 years) with scattered large residuals.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

No Class III streams in Unit.

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure to provide necessary habitat characteristics for forest dwelling species. Entire unit will be harvested using an alternative silvicultural prescription (See below). This should exceed the TLMP Standards and Guidelines for the entire the unit.

##### **4. Visuals:**

Landscape viewed in the middle-ground from Port Camden. Past harvest activities are evident, yet work with features found in the characteristic landscape. Unit falls within the west Port Camden viewshed, future activities are designed to be consistent with the existing harvest patterns. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46360 runs along the top of the unit. A temporary spur runs down to the edge of a bench overlooking the lower portion of the unit. The spur will be obliterated and the specified road put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using cable yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow.

#### **D. UNIT DESIGN:**

Unit avoids areas of highly fractured bedrock. Partial suspension is required in unit to protect soils. Upper backline is on steeper slopes where timber has developed a natural windfirmness due to topographic relation to the prevailing winds. Northern boundary takes advantage of muskeg to minimize risk of blowdown. Unit shaped to minimize apparent size and work with topographic features found in the landscape.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 420-47.4

Management Prescription: **Timber Production**

Acres Even Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 27

Desired Future Condition **2-aged**

Acres Uneven Aged 0

Volume(MBF) 513

USGS 1/4 QUAD MAP #: **PBG C6 NW**

Aerial Photo: 77

Flight# 13

Photo# 51

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

South winds predominate -- incorporate disturbance ecology principles.

Area of incompetent, highly fractured, volcanoclastic rock in area -- avoid these areas.

Unit is seen from saltwater -- meet VQO of modification.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

No streams in unit.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is multi cohort with area of early understory reinitiation (160 years) with scattered large residuals.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

No Class III streams in Unit.

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure to provide necessary habitat characteristics for forest dwelling species. Entire unit will be harvested using an alternative silvicultural prescription (See below). This should exceed the TLMP Standards and Guidelines for the entire the unit.

##### **4. Visuals:**

Landscape viewed in the middle-ground from Port Camden. Past harvest activities are evident, yet work with features found in the characteristic landscape. Unit falls within the west Port Camden viewshed, future activities are designed to be consistent with the existing harvest patterns Unit meets partial retention VQO as designed..

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46360 runs along the top of the unit. A temporary spur runs down to the edge of a bench overlooking the lower portion of the unit. The spur will be obliterated and the specified road put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

Seed Tree with Reserves using cable yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and plant 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow.

#### **D. UNIT DESIGN:**

Unit avoids areas of highly fractured bedrock. Partial suspension is required in unit to protect soils. Upper backline is on steeper slopes where timber has developed a natural windfirmness due to topographic relation to the prevailing winds. Northern boundary takes advantage of muskeg to minimize risk of blowdown. Unit shaped to minimize apparent size and work with topographic features found in the landscape.



CRANE and ROWAN MOUNTAIN UNIT PLAN

<b>VCU-UNIT.ALT</b>	<b>420-48.5</b>		
Management Prescription:	Timber Production	Acres Even Aged:	42
Natural Stand Condition:	Old Growth/Understory Reinitiation	Acres 2-Aged:	0
Desired Future Condition	Even aged	Acres Uneven Aged	0
		Volume(MBF)	1411.2
USGS 1/4 QUAD MAP #:	PBG D6 SW	Aerial Photo:	77
		Flight#	13
		Photo#	51

RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class III stream north of unit -- maintain stream channel stability.  
Southerly winds predominate -- incorporate disturbance ecology principles.  
Unit is seen from saltwater -- meet modification VQO.

IMPLEMENTATION ACTIVITIES

ECOSYSTEMS MANAGEMENT:

1. Vegetation:  
Stand appears to be oldgrowth with patches of windthrow of 160 year cohort.
2. Aquatic Habitat:  
No Class I/II streams in Unit.  
Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Stream to the north is in the High Gradient Contained Process Group. Manage the area within 120 feet from the top of the V-notch to provide for windfirmness by feathering the unit boundary. The deep V-notch will provide topographic protection for the no-cut buffer. Southeast winds predominate.
3. Wildlife Habitat:  
Unit is in medium deer HSI value and high Marten HIS value. South facing slope below 700 feet in elevation.
4. Visuals:  
Landscape viewed in the middle-ground from Port Camden. Past harvest activities are evident, yet work with features found in the characteristic landscape. Unit falls within the west Port Camden viewshed, future activities are designed to be consistent with the existing harvest patterns. Unit meets modification VQO as designed.

B. TRANSPORTATION SYSTEM:

Specified road 46360 runs to the last landing (the north setting). It will continue past this unit in the future. A short temporary spur is needed for the eastern setting. The spur will be obliterated and the specified road put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

C. SILVICULTURAL PRESCRIPTION SUMMARY:

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) is same as (a) with uphill cable yarding system.

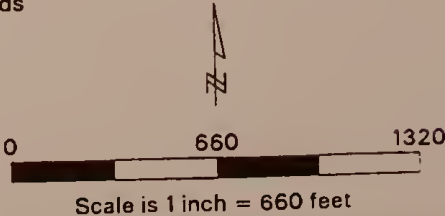
D. UNIT DESIGN:

Northern boundary is located over the slope break of the Class III stream to protect buffer from wind, but still avoids the steepest area of the streambank. Lower boundary is intentionally irregular to meet visual objectives.

Crane/Rowan Timber Harvest Unit 420-48



- |  |                                     |  |                                   |
|--|-------------------------------------|--|-----------------------------------|
|  | Proposed Unit Boundaries            |  | Existing Forest Development Roads |
|  | Non-NF Lands                        |  | Existing Closed Roads             |
|  | Existing and Planned Managed Stands |  | Proposed Forest Development Roads |
|  | Riparian Management Area            |  | Proposed Temporary Roads          |
|  | AHMU-Class 1 Streams                |  | 500-ft. Contour Interval          |
|  | AHMU-Class 2 Streams                |  | 100-ft. Contour Interval          |
|  | AHMU-Class 3 Streams                |  |                                   |
|  | AHMU-Class 4 Streams                |  |                                   |





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT 420-48.2**

Management Prescription: **Timber Production**

Acres Even Aged: 42

Natural Stand Condition: **Old Growth/Understory Reinitiation**

Acres 2-Aged: 0

Desired Future Condition **Even aged**

Acres Uneven Aged 0

Volume(MBF) 1411.2

USGS 1/4 QUAD MAP #: **PBG D6 SW**

Aerial Photo: 77 Flight# 13 Photo# 51

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class III stream north of unit -- maintain stream channel stability.  
Southerly winds predominate -- incorporate disturbance ecology principles.  
Unit is seen from saltwater -- meet modification VQO.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand appears to be oldgrowth with patches of windthrow of 160 year cohort.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Stream to the north is in the High Gradient Contained Process Group. Manage the area within 120 feet from the top of the V-notch to provide for windfirmness by feathering the unit boundary. The deep V-notch will provide topographic protection for the no-cut buffer. Southeast winds predominate.

##### **3. Wildlife Habitat:**

Unit is in medium deer HSI value and high Marten HIS value. South facing slope below 700 feet in elevation.

##### **4. Visuals:**

Landscape viewed in the middle-ground from Port Camden. Past harvest activities are evident, yet work with features found in the characteristic landscape. Unit falls within the west Port Camden viewshed, future activities are designed to be consistent with the existing harvest patterns. Unit meets modification VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46360 runs to the last landing (the north setting). It will continue past this unit in the future. A short temporary spur is needed for the eastern setting. The spur will be obliterated and the specified road put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) is same as (a) with uphill cable yarding system.

#### **D. UNIT DESIGN:**

Northern boundary is located over the slope break of the Class III stream to protect buffer from wind, but still avoids the steepest area of the streambank. Lower boundary is intentionally irregular to meet visual objectives.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 420-48.3

Management Prescription: **Timber Production**

Acres Even Aged: 8

Natural Stand Condition: **Old Growth/Understory Reinitiation**

Acres 2-Aged: 34

Desired Future Condition **Even aged, 2-aged mixture**

Acres Uneven Aged 0

Volume(MBF) 914.8

USGS 1/4 QUAD MAP #: **PBG D6 SW**

Aerial Photo: 77 Flight# 13 Photo# 51

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class III stream north of unit -- maintain stream channel stability.

Southerly winds predominate -- incorporate disturbance ecology principles.

Unit is seen from saltwater -- meet modification VQO.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand appears to be oldgrowth with patches of windthrow of 160 year cohort.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Stream to the north is in the High Gradient Contained Process Group. Manage the area within 120 feet from the top of the V-notch to provide for windfirmness by feathering the unit boundary. The deep V-notch will provide topographic protection for the no-cut buffer. Southeast winds predominate.

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure to provide necessary habitat characteristics for forest dwelling species. Lower portion of the unit will be harvested using an alternative silvicultural prescription (See below). This should exceed the TLMP Standards and Guidelines for that portion of the unit. The upper portion of the unit will be clearcut. This will meet all the TLMP Standards & Guidelines.

##### **4. Visuals:**

Landscape viewed in the middle-ground from Port Camden. Past harvest activities are evident, yet work with features found in the characteristic landscape. Unit falls within the west Port Camden viewshed, future activities are designed to be consistent with the existing harvest patterns. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46360 runs to the last landing (the north setting). It will continue past this unit in the future. A short temporary spur is needed for the eastern setting. The spur will be obliterated and the specified road put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) Seed Tree with Reserves using cable yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow.

#### **D. UNIT DESIGN:**

Northern boundary is located over the slope break of the Class III stream to protect buffer from wind, but still avoids the steepest area of the streambank. Lower boundary is intentionally irregular to meet visual objectives.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 420-48.4

Management Prescription: Timber Production

Acres Even Aged: 8

Natural Stand Condition: Old Growth/Understory Reinitiation

Acres 2-Aged: 34

Desired Future Condition: Even aged, 2-aged mixture

Acres Uneven Aged: 0

Volume(MBF) 914.8

USGS 1/4 QUAD MAP #: PBG D6 SW

Aerial Photo: 77

Flight# 13

Photo# 51

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class III stream north of unit -- maintain stream channel stability.

Southerly winds predominate -- incorporate disturbance ecology principles.

Unit is seen from saltwater -- meet modification VQO.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand appears to be oldgrowth with patches of windthrow of 160 year cohort.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) Stream to the north is in the High Gradient Contained Process Group. Manage the area within 120 feet from the top of the V-notch to provide for windfirmness by feathering the unit boundary. The deep V-notch will provide topographic protection for the no-cut buffer. Southeast winds predominate.

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure to provide necessary habitat characteristics for forest dwelling species. Lower portion of the unit will be harvested using an alternative silvicultural prescription (See below). This should exceed the TLMP Standards and Guidelines for that portion of the unit. The upper portion of the unit will be clearcut. This will meet all the TLMP Standards & Guidelines.

##### **4. Visuals:**

Landscape viewed in the middle-ground from Port Camden. Past harvest activities are evident, yet work with features found in the characteristic landscape. Unit falls within the west Port Camden viewshed, future activities are designed to be consistent with the existing harvest patterns. Unit meets partial retention VQO as designed.

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46360 runs to the last landing (the north setting). It will continue past this unit in the future. A short temporary spur is needed for the eastern setting. The spur will be obliterated and the specified road put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) Seed Tree with Reserves using cable yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow.

#### **D. UNIT DESIGN:**

Northern boundary is located over the slope break of the Class III stream to protect buffer from wind, but still avoids the steepest area of the streambank. Lower boundary is intentionally irregular to meet visual objectives.



# CRANE and ROWAN MOUNTAIN UNIT PLAN

VCU-UNIT.ALT 421-49.5

Management Prescription: Timber Production

Natural Stand Condition: Understory Reinitiation

Desired Future Condition Even aged

Acres Even Aged: 97

Acres 2-Aged: 0

Acres Uneven Aged 0

Volume(MBF) 3259.2

Aerial Photo: 77 Flight# 9 Photo# 145

USGS 1/4 QUAD MAP #: PTAD1 SE

## RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

(Unit was laid out under N & E Kuiu ROD direction)  
Unit modifications are not necessary to meet TLMP Revision Standards & Guidelines.  
Class I and II stream on western boundary - maintain windfirm riparian buffer.  
Class III stream on northwest corner - maintain windfirm riparian buffer.  
Class IV stream in middle of unit and another extending into the southern boundary - maintain stream channel stability.  
Western boundary stream is deeply incised with unstable stream banks - avoid unstable soils.  
Southwest winds predominate - incorporate disturbance ecology principles.

## IMPLEMENTATION ACTIVITIES

### A. ECOSYSTEMS MANAGEMENT:

#### 1. Vegetation:

Stand is windthrown with several cohorts evident.

#### 2. Aquatic Habitat:

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream to the west is in the High Gradient Contained Process Group. Manage the area 120 feet beyond the V-notch to provide for windfirmness. Since this buffer will be exposed to SE winds, remove any tall trees and feather the buffer.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream to the north is in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch to provide for windfirmness. Since SE winds predominate, pay special attention to the layout of this buffer.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

#### 3. Wildlife Habitat:

Unit is in high/medium deer HSI value and high Marten HIS value. South facing slope below 1300 feet in elevation.

#### 4. Visuals:

### B. TRANSPORTATION SYSTEM:

Specified road 46152 runs up through the unit and continues towards the east to units 421-50 & 51. Specified road 46154 accesses the northeast settings of this unit and will continue in the future. Two short temporary are needed to reach landing sites. The spurs will be obliterated and the specified road put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

### C. SILVICULTURAL PRESCRIPTION SUMMARY:

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) is same as (a) with uphill cable yarding system.

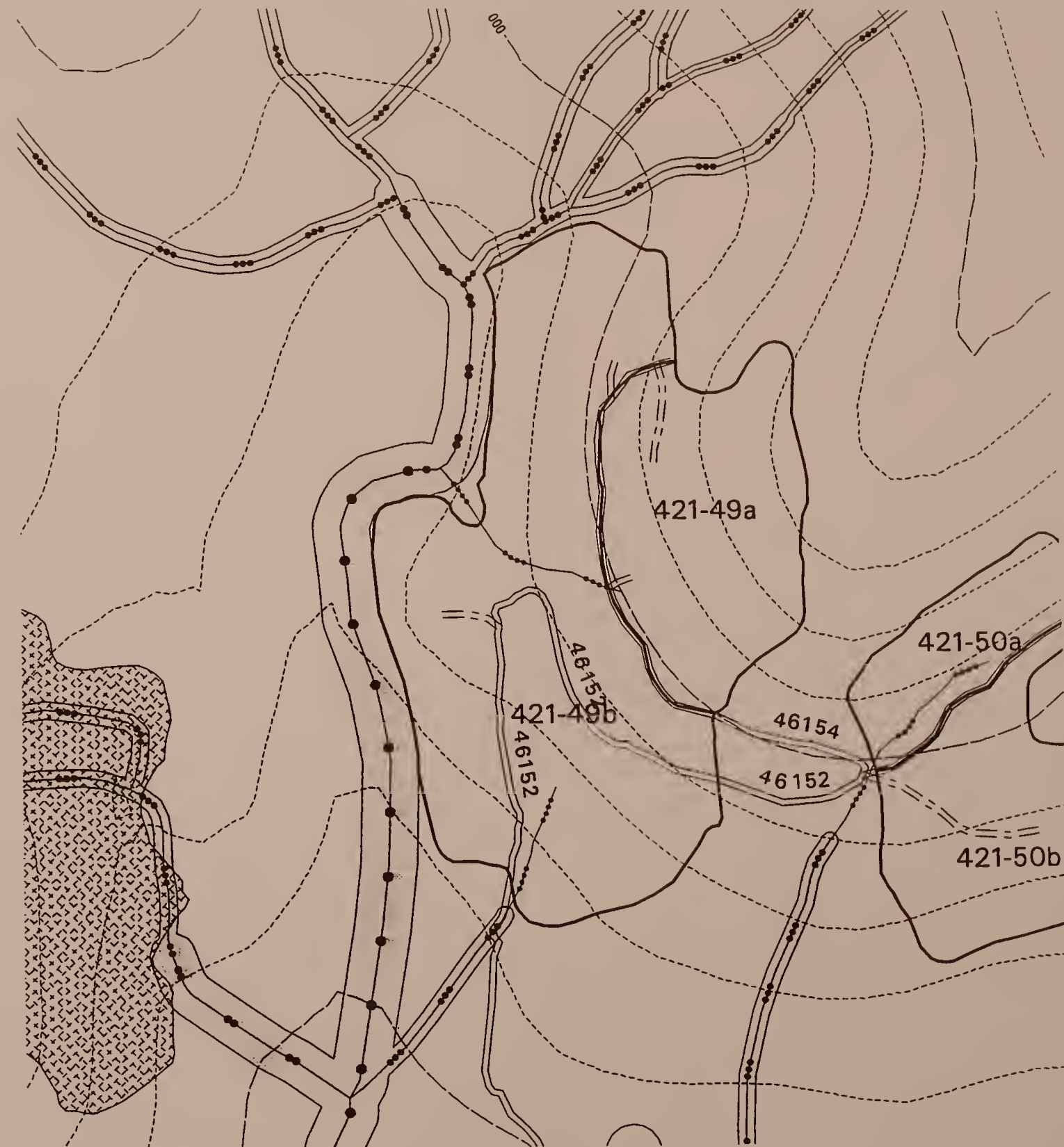
### D. UNIT DESIGN:

Locate unit boundary at the upper slope break of the incised v-notch (more than 100-feet away from stream).

Stream buffer is undisturbed on the west side, so should remain windfirm.

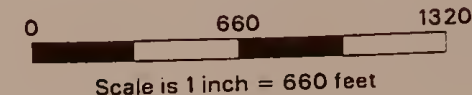
There is some windthrow risk to the eastern upper boundary.

## Crane/Rowan Timber Harvest Unit 421-49



- Proposed Unit Boundaries
- Non-NF Lands
- Existing and Planned Managed Stands
- Riparian Management Area
- AHMu-Class 1 Streams
- AHMu-Class 2 Streams
- AHMu-Class 3 Streams
- AHMu-Class 4 Streams

- Existing Forest Development Roads
- Existing Closed Roads
- Proposed Forest Development Roads
- Proposed Temporary Roads
- 500-ft. Contour Interval
- 100-ft. Contour Interval





**VCU-UNIT.ALT** 421-49.2

Acres Even Aged: 97

Management Prescription: **Timber Production**

Acres 2-Aged: 0

Natural Stand Condition: **Understory Reinitiation**

Acres Uneven Aged 0

Desired Future Condition **Even aged**

Volume(MBF) 3259.2

USGS 1/4 QUAD MAP #: **PTAD1 SE**

Aerial Photo: 77

Flight# 9

Photo# 145

**I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES**

(Unit was laid out under N &amp; E Kuiu ROD direction)

Unit modifications are not necessary to meet TLMP Revision Standards &amp; Guidelines.

Class I and II stream on western boundary - maintain windfirm riparian buffer.

Class III stream on northwest corner - maintain windfirm riparian buffer.

Class IV stream in middle of unit and another extending into the southern boundary - maintain stream channel stability.

Western boundary stream is deeply incised with unstable stream banks - avoid unstable soils.

Southwest winds predominate - incorporate disturbance ecology principles.

**II. IMPLEMENTATION ACTIVITIES****A. ECOSYSTEMS MANAGEMENT:****1. Vegetation:**

Stand is windthrown with several cohorts evident.

**2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream to the west is in the High Gradient Contained Process Group. Manage the area 120 feet beyond the V-notch to provide for windfirmness. Since this buffer will be exposed to SE winds, remove any tall trees and feather the buffer.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream to the north is in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch to provide for windfirmness. Since SE winds predominate, pay special attention to the layout of this buffer.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

**3. Wildlife Habitat:**

Unit is in high/medium deer HSI value and high Marten HIS value. South facing slope below 1300 feet in elevation.

**4. Visuals:****B. TRANSPORTATION SYSTEM:**

Specified road 46152 runs up through the unit and continues towards the east to units 421-50 & 51. Specified road 46154 accesses the northeast settings of this unit and will continue in the future. Two short temporary are needed to reach landing sites. The spurs will be obliterated and the specified road put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

**C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) is same as (a) with uphill cable yarding system.

**D. UNIT DESIGN:**

Locate unit boundary at the upper slope break of the incised v-notch (more than 100-feet away from stream).

Stream buffer is undisturbed on the west side, so should remain windfirm.

There is some windthrow risk to the eastern upper boundary.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 421-49.3

Management Prescription: Timber Production

Acres Even Aged: 29

Natural Stand Condition: Understory Reinitiation

Acres 2-Aged: 68

Desired Future Condition Even aged, 2-aged mixture

Acres Uneven Aged 0

Volume(MBF) 2266.4

USGS 1/4 QUAD MAP #: PTA D1 SE

Aerial Photo: 77

Flight# 9

Photo# 145

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

(Unit was laid out under N & E Kuiu ROD direction. Unit modifications are not necessary to meet TLMP Revision Standards & Guidelines.

Class I and II stream on western boundary - maintain windfirm riparian buffer.

Class III stream on northwest corner - maintain windfirm riparian buffer.

Class IV stream in middle of unit and another extending into the southern boundary - maintain stream channel stability.

Western boundary stream is deeply incised with unstable stream banks - avoid unstable soils.

Southwest winds predominate - incorporate disturbance ecology principles.

Stand is Understory Reinitiation windthrown multi-cohort - maintain multicohort structure.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is windthrown with several cohorts evident.

##### **2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream to the west is in the High Gradient Contained Process Group. Manage the area 120 feet beyond the V-notch to provide for windfirmness. Since this buffer will be exposed to SE winds, remove any tall trees and feather the buffer.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream to the north is in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch to provide for windfirmness. Since SE winds predominate, pay special attention to the layout of this buffer.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Part of the unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46152 runs up through the unit and continues towards the east to units 421-50 & 51. Specified road 46154 accesses the northeast settings of this unit and will continue in the future. Two short temporary are needed to reach landing sites. The spurs will be obliterated and the specified road put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) Seed Tree with Reserves using cable yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow.

#### **D. UNIT DESIGN:**

Locate unit boundary at the upper slope break of the incised v-notch (more than 100-feet away from stream). Stream buffer is undisturbed on the west side, so should remain windfirm.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 421-49.4

Management Prescription: **Timber Production**

Acres Even Aged: 29

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 68

Desired Future Condition **Even aged, 2-aged mixture**

Acres Uneven Aged 0

Volume(MBF) 2266.4

USGS 1/4 QUAD MAP #: **PTA D1 SE**

Aerial Photo: 77

Flight# 9

Photo# 145

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

(Unit was laid out under N & E Kuiu ROD direction)

Unit modifications are not necessary to meet TLMP Revision Standards & Guidelines.

Class I and II stream on western boundary - maintain windfirm riparian buffer.

Class III stream on northwest corner - maintain windfirm riparian buffer.

Class IV stream in middle of unit and another extending into the southern boundary - maintain stream channel stability.

Western boundary stream is deeply incised with unstable stream banks - avoid unstable soils.

Southwest winds predominate - incorporate disturbance ecology principles.

Stand is Understory Reinitiation windthrown multi-cohort - maintain multicohort structure.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is windthrown with several cohorts evident.

##### **2. Aquatic Habitat:**

Class I/II: No commercial harvest within 100 feet. No programmed commercial harvest within the RMA. Manage an appropriate distance beyond the no harvest zone to provide windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream to the west is in the High Gradient Contained Process Group. Manage the area 120 feet beyond the V-notch to provide for windfirmness. Since this buffer will be exposed to SE winds, remove any tall trees and feather the buffer.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The stream to the north is in the High Gradient Contained Process Group. Manage the area within 120 feet of the V-notch to provide for windfirmness. Since SE winds predominate, pay special attention to the layout of this buffer.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Part of the unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46152 runs up through the unit and continues towards the east to units 421-50 & 51. Specified road 46154 accesses the northeast settings of this unit and will continue in the future. Two short temporary are needed to reach landing sites. The spurs will be obliterated and the specified road put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) Seed Tree with Reserves using cable yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow.

#### **D. UNIT DESIGN:**

Locate unit boundary at the upper slope break of the incised v-notch (more than 100-feet away from stream).

Stream buffer is undisturbed on the west side, so should remain windfirm.

There is some windthrow risk to the eastern upper boundary.



CRANE and ROWAN MOUNTAIN UNIT PLAN

VCU-UNIT.ALT 421-50.5

Management Prescription: Timber Production

Natural Stand Condition: Old Growth

Desired Future Condition: Even aged

Acres Even Aged: 39

Acres 2-Aged: 0

Acres Uneven Aged: 0

Volume(MBF) 1310.4

Aerial Photo: 77 Flight# 9 Photo# 145

RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

- Class III stream to the east of unit - maintain stream channel stability.
- Class IV stream in upper portion of unit
- Stream to the east is deeply incised with unstable stream banks - avoid unstable soils.
- Southwest winds predominate - incorporate disturbance ecology principles.

IMPLEMENTATION ACTIVITIES

A. ECOSYSTEMS MANAGEMENT:

- Vegetation:**  
Stand is poor site and is an open stand with no apparent cohorts
- Aquatic Habitat:**  
No Class III streams in Unit.  
Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The unit is designed to avoid the Class III to the east. Both streams are in the High Gradient Contained Process Group. Manage the area within 120 feet from the top of the V-notch for windfirmness. Since southeast winds predominate and the streams are parallel to prevailing winds, the no-cut buffer should be windfirm.  
Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)
- Wildlife Habitat:**  
Unit is in high/medium deer HSI value and high Marten HIS value. South facing slope below 1300 feet in elevation.
- Visuals:**

B. TRANSPORTATION SYSTEM:

Specified road 46152 continues through the northern setting. A temporary spur road will access southern setting. The spur will be obliterated and the specified road put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

C. SILVICULTURAL PRESCRIPTION SUMMARY:

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) is same as (a) with uphill cable yarding system.

D. UNIT DESIGN:

Eastern boundary follows scrubby windfirm timber.  
Minimize sharp corners during unit layout to ensure meeting inventoried VQO of Modification.  
The 200-foot buffer along the Class III stream was designed to stay out of the steep v-notch.

Crane/Rowan Timber Harvest Unit 421-50



- |  |                                     |  |                                   |
|--|-------------------------------------|--|-----------------------------------|
|  | Proposed Unit Boundaries            |  | Existing Forest Development Roads |
|  | Non-NF Lands                        |  | Existing Closed Roads             |
|  | Existing and Planned Managed Stands |  | Proposed Forest Development Roads |
|  | Riparian Management Area            |  | Proposed Temporary Roads          |
|  | AHMu-Class 1 Streams                |  | 500-ft. Contour Interval          |
|  | AHMu-Class 2 Streams                |  | 100-ft. Contour Interval          |
|  | AHMu-Class 3 Streams                |  |                                   |
|  | AHMu-Class 4 Streams                |  |                                   |



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 421-50.2

Acres Even Aged: 39

Management Prescription: **Timber Production**

Acres 2-Aged: 0

Natural Stand Condition: **Old Growth**

Acres Uneven Aged: 0

Desired Future Condition: **Even aged**

Volume(MBF) 1310.4

USGS 1/4 QUAD MAP #: **PTAD1 SE**

Aerial Photo: 77 Flight# 9 Photo# 145

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class III stream to the east of unit - maintain stream channel stability.  
Class IV stream in upper portion of unit  
Stream to the east is deeply incised with unstable stream banks - avoid unstable soils.  
Southwest winds predominate - incorporate disturbance ecology principles.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is poor site and is an open stand with no apparent cohorts

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The unit is designed to avoid the Class III to the east.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream.  
Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Unit is in high/medium deer HSI value and high Marten HIS value. South facing slope below 1300 feet in elevation.

##### **4. Visuals:**

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46152 continues through the northern setting. A temporary spur road will access southern setting. The spur will be obliterated and the specified road put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) is same as (a) with uphill cable yarding system.

#### **D. UNIT DESIGN:**

Eastern boundary follows scrubby windfirm timber.  
Minimize sharp corners during unit layout to ensure meeting inventoried VQO of Modification.  
The 200-foot buffer along the Class III stream was designed to stay out of the steep v-notch.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 421-50.3

Acres Even Aged: 12

Management Prescription: **Timber Production**

Acres 2-Aged: 27

Natural Stand Condition: **Old Growth**

Acres Uneven Aged 0

Desired Future Condition **Even aged, 2-aged mixture**

Volume(MBF) 916.2

USGS 1/4 QUAD MAP #: **PTA D1 SE**

Aerial Photo: 77 Flight# 9 Photo# 145

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class III stream to the east of unit - maintain stream channel stability.

Class IV stream in upper portion of unit

Stream to the east is deeply incised with unstable stream banks - avoid unstable soils.

Southwest winds predominate - incorporate disturbance ecology principles.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is poor site and is an open stand with no apparent cohorts.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The unit is designed to avoid the Class III to the east.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Part of the unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46152 continues through the northern setting. A temporary spur road will access southern setting. The spur will be obliterated and the specified road put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) Seed Tree with Reserves using cable yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow.

#### **D. UNIT DESIGN:**

Eastern boundary follows scrubby windfirm timber.

Minimize sharp corners during unit layout to ensure meeting inventoried VQO of Modification.

The 200-foot buffer along the Class III stream was designed to stay out of the steep v-notch.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 421-50.4

Acres Even Aged: 12

Management Prescription: **Timber Production**

Acres 2-Aged: 27

Natural Stand Condition: **Old Growth**

Acres Uneven Aged 0

Desired Future Condition **Even aged, 2-aged mixture**

Volume(MBF) 916.2

USGS 1/4 QUAD MAP #: **PTAD1 SE**

Aerial Photo: 77 Flight# 9 Photo# 145

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class III stream to the east of unit - maintain stream channel stability.

Class IC in upper portion of unit.

Stream to the east is deeply incised with unstable stream banks - avoid unstable soils.

Southwest winds predominate - incorporate disturbance ecology principles.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is poor site and is an open stand with no apparent cohorts.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The unit is designed to avoid the Class III to the east.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Part of the unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46152 continues through the northern setting. A temporary spur road will access southern setting. The spur will be obliterated and the specified road put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) Seed Tree with Reserves using cable yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow.

#### **D. UNIT DESIGN:**

Eastern boundary follows scrubby windfirm timber.

Minimize sharp corners during unit layout to ensure meeting inventoried VQO of Modification.

The 200-foot buffer along the Class III stream was designed to stay out of the steep v-notch.



CRANE and ROWAN MOUNTAIN UNIT PLAN

VCU-UNIT.ALT 421-51.5

Management Prescription: Timber Production

Natural Stand Condition: Understory Reinitiation

Desired Future Condition: Even aged

Acres Even Aged: 57

Acres 2-Aged: 0

Acres Uneven Aged: 0

Volume(MBF) 1915.2

Aerial Photo: 77 Flight# 9 Photo# 145

USGS 1/4 QUAD MAP #: PTAD1 SE

RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class III streams on east and west sides of unit - maintain stream channel stability.  
Class IV stream within unit - provide - maintain stream channel stability.  
Southwest winds predominate - incorporate disturbance ecology principles.

IMPLEMENTATION ACTIVITIES

A. ECOSYSTEMS MANAGEMENT:

1. Vegetation:

Stand is of wind origin and is in understory reinitiation stage.

2. Aquatic Habitat:

No Class I/II streams in Unit.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The unit is designed to avoid the Class III to the east. Both streams are in the High Gradient Contained Process Group. Manage the area within 120 feet from the top of the V-notch for windfirmness. Both buffers may be exposed to wind because there is evidence in the area of both SE and SW wind.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

3. Wildlife Habitat:

Unit is in high/medium deer HSI value and high Marten HIS value. South facing slope below 1300 feet in elevation.

4. Visuals:

B. TRANSPORTATION SYSTEM:

Specified road 46360 runs to the last landing (the eastern setting). It will continue past this unit in the future. The specified road will be put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

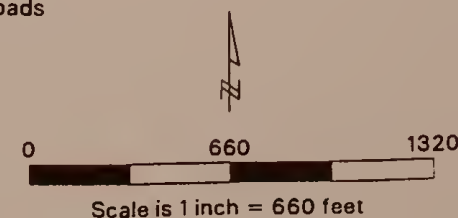
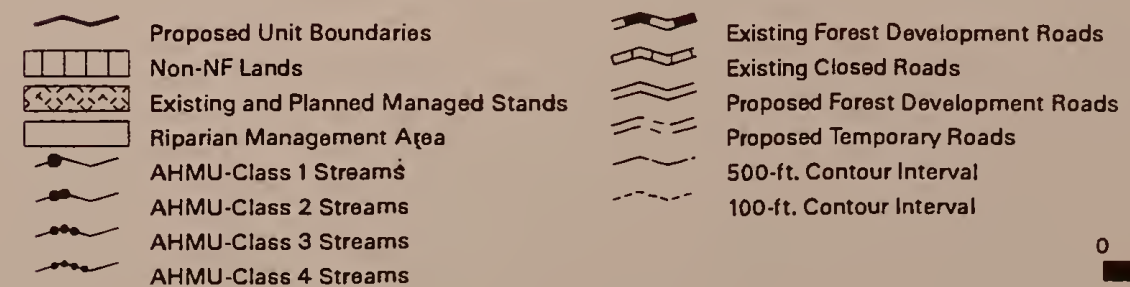
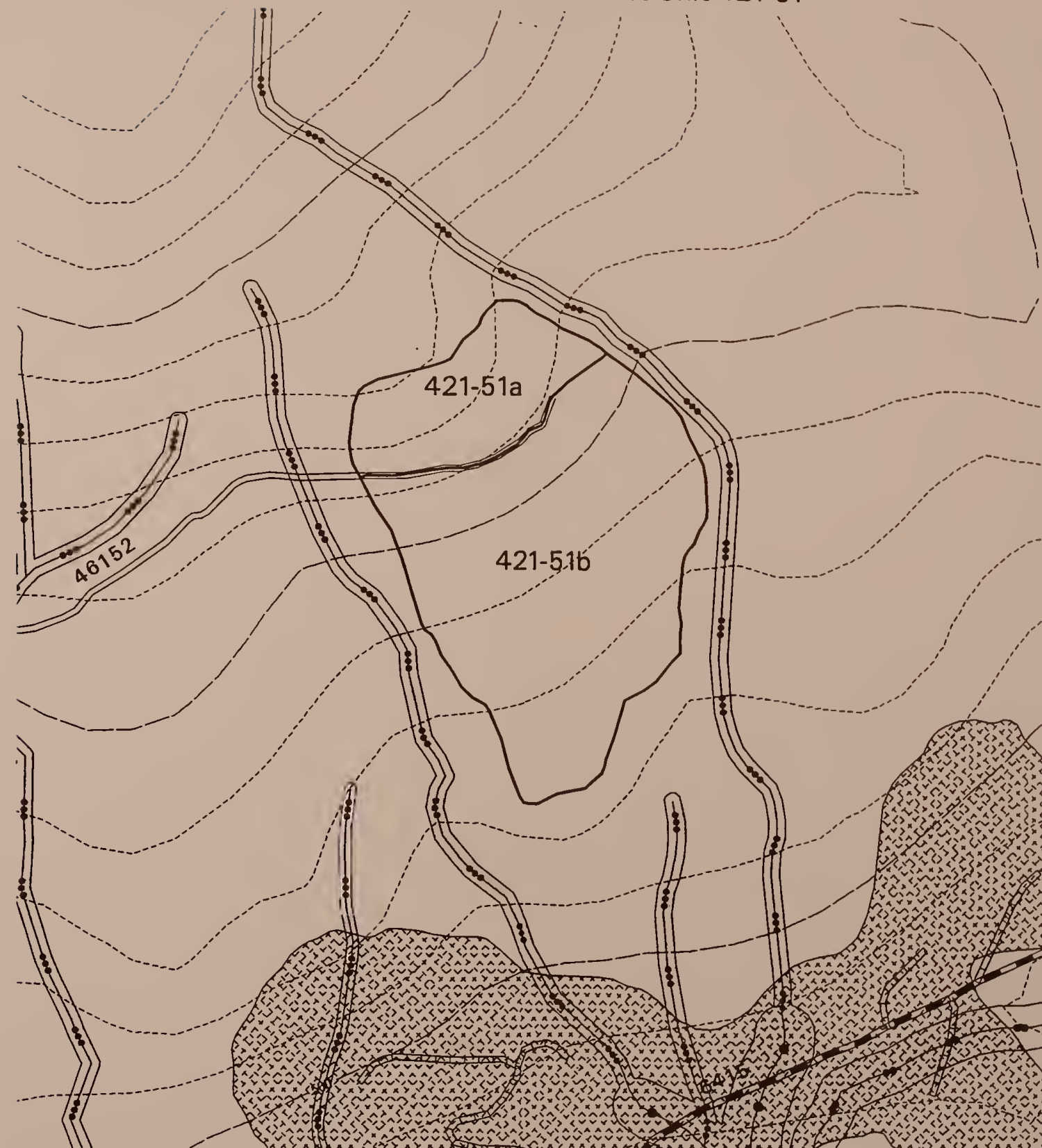
C. SILVICULTURAL PRESCRIPTION SUMMARY:

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) is same as (a) with uphill cable yarding system.

D. UNIT DESIGN:

The extended buffers along Class III streams were designed to protect the steep v-notch.  
V-notch along east side of unit will have extended buffer to insure windfirmness.

Crane/Rowan Timber Harvest Unit 421-51





## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 421-51.2

Management Prescription: **Timber Production**

Acres Even Aged: 57

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 0

Desired Future Condition **Even aged**

Acres Uneven Aged 0

Volume(MBF) 1915.2

USGS 1/4 QUAD MAP #: **PTA D1 SE**

Aerial Photo: 77 Flight# 9 Photo# 145

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class III streams on east and west sides of unit - maintain stream channel stability.

Class IV stream within unit - provide - maintain stream channel stability.

Southwest winds predominate - incorporate disturbance ecology principles.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is of wind origin and is in understory reinitiation stage.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The unit is designed to avoid the Class III to the east. Both streams are in the High Gradient Contained Process Group. Manage the area within 120 feet from the top of the V-notch for windfirmness. Both buffers may be exposed to wind because there is evidence in the area of both SE and SW wind.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream. Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Unit is in high/medium deer HSI value and high Marten HIS value. South facing slope below 1300 feet in elevation.

##### **4. Visuals:**

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46360 runs to the last landing (the eastern setting). It will continue past this unit in the future. The specified road will be put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) is same as (a) with uphill cable yarding system.

#### **D. UNIT DESIGN:**

The extended buffers along Class III streams were designed to protect the steep v-notch. V-notch along east side of unit will have extended buffer to insure windfirmness.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 421-51.3

Management Prescription: **Timber Production**

Acres Even Aged: 13

Natural Stand Condition: **Understory Reinitiation**

Acres 2-Aged: 44

Desired Future Condition **Even aged, 2-aged mixture**

Acres Uneven Aged 0

Volume(MBF) 1272.8

USGS 1/4 QUAD MAP #: **PTA D1 SE**

Aerial Photo: 77

Flight# 9

Photo# 145

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class III streams on east and west sides of unit - maintain stream channel stability.

Class IV stream within unit - provide - maintain stream channel stability.

Southwest winds predominate - incorporate disturbance ecology principles.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is of wind origin and is in understory reinitiation stage.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The unit is designed to avoid the Class III to the east. Both streams are in the High Gradient Contained Process Group. Manage the area within 120 feet from the top of the V-notch for windfirmness. Both buffers may be exposed to wind because there is evidence in the area of both SE and SW wind.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream.

Partially suspend logs over the stream. (BMP 13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Part of the unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46360 runs to the last landing (the eastern setting). It will continue past this unit in the future. The specified road will be put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) Seed Tree with Reserves using cable yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**

The buffers along Class III streams will be protected by the multi-cohort stand structure remaining after harvest.



## CRANE and ROWAN MOUNTAIN UNIT PLAN

**VCU-UNIT.ALT** 421-51.4

Acres Even Aged: 13

Management Prescription: Timber Production

Acres 2-Aged: 44

Natural Stand Condition: Understory Reinitiation

Acres Uneven Aged 0

Desired Future Condition Even aged, 2-aged mixture

Volume(MBF) 1272.8

USGS 1/4 QUAD MAP #: PTAD1 SE

Aerial Photo: 77

Flight# 9

Photo# 145

### I. RESOURCE CONCERNS/OPPORTUNITIES - UNIT MANAGEMENT OBJECTIVES

Class III streams on east and west sides of unit - maintain stream channel stability.

Class IV stream within unit - provide - maintain stream channel stability.

Southwest winds predominate - incorporate disturbance ecology principles.

Wildlife Habitat - Maintain legacy structure in unit where possible for prey species habitat through alternative silvicultural prescription.

### II. IMPLEMENTATION ACTIVITIES

#### **A. ECOSYSTEMS MANAGEMENT:**

##### **1. Vegetation:**

Stand is of wind origin and is in understory reinitiation stage.

##### **2. Aquatic Habitat:**

No Class I/II streams in Unit.

Class III: No programmed commercial timber harvest within the V-notch (side-slope break). Manage an appropriate distance beyond the slope break for windfirmness. (BMP 12.6 Riparian Area Designation and Protection; BMP 13.16 Stream Channel Protection) The unit is designed to avoid the Class III to the east. Both streams are in the High Gradient Contained Process Group. Manage the area within 120 feet from the top of the V-notch for windfirmness. Both buffers may be exposed to wind because there is evidence in the area of both SE and SW wind.

Class IV: Provide adequate deflection to minimize soil disturbance by using tailtrees on ridge adjacent to the stream.

Partially suspend logs over the stream.( BMP13.16 Stream Channel Protection)

##### **3. Wildlife Habitat:**

Retain multi-cohort stand structure and legacy to provide necessary habitat characteristics for forest dwelling species. Part of the unit will be harvested using alternative silvicultural prescriptions. This should exceed TLMP S&Gs.

##### **4. Visuals:**

#### **B. TRANSPORTATION SYSTEM:**

Specified road 46360 runs to the last landing (the eastern setting). It will continue past this unit in the future. The specified road will be put into "storage" after harvest is complete. All drainage structures will be removed or bypassed to restore natural drainage patterns. Additional waterbars will be added as needed, and all areas of exposed soil will be grass seeded.

#### **C. SILVICULTURAL PRESCRIPTION SUMMARY:**

(a) Clearcut for natural regeneration, use downhill cable yarding, manage as even-aged stand, certify regeneration, pre-commercial thin to increase diameter growth and to provide light for shrubs and forbs. (b) Seed Tree with Reserves using cable yarding, use upper and lower diameter limit Rx for hemlock and cedar. Reserve and paint 1 large spruce every 10 acres. Initial managed stand will have 3 cohorts; 1) Young trees from regeneration harvest. 2) Small residuals left from lower dia. limit harvest 3) Large residual trees with high wildlife value. Over time, it is expected that a 2-aged stand will develop as large trees are removed through senescence and wind snap or by windthrow

#### **D. UNIT DESIGN:**












The extended buffers along Class III streams were designed to protect the steep v-notrch.

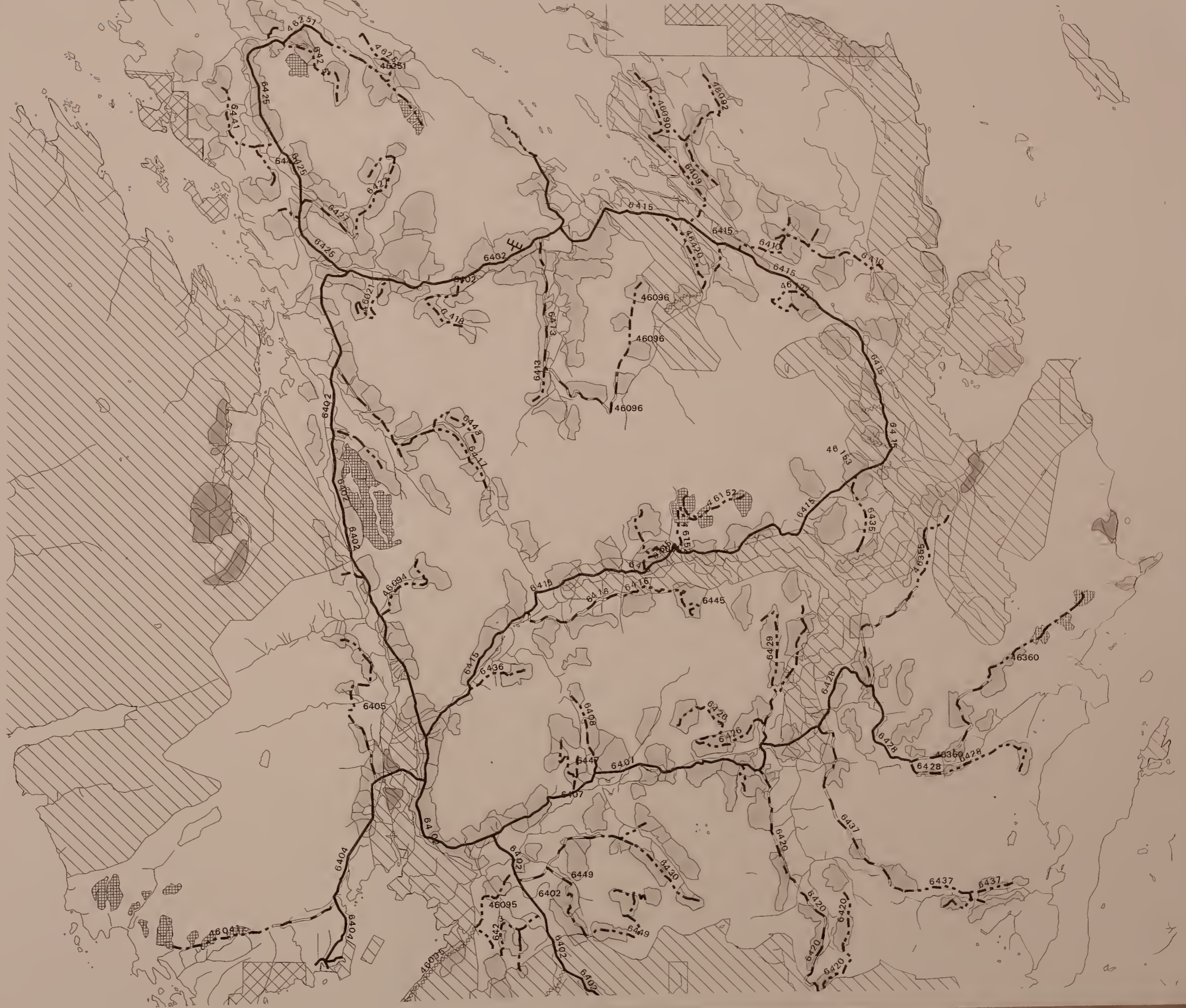
V-notch along east side of unit will have extended buffer to insure windfirmness.



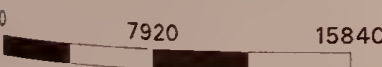
## Road Management Objectives Maintenance Strategy

Legend

-  Active Maintenance, All Vehicle Road
-  Stormproofed, High Clearance Road
-  Closed Roads in Storage
-  Obliterated Road Removed from Transportation System
-  Shoreline, Lakes, Class I/II Streams
-  Existing Clearcut Harvest Units
-  Existing Partial Cut Harvest Units
-  Crane/Rowan Proposed Units
-  Non Timber LUDs
-  Non-National Forest Lands
-  Log Transfer Facility (LTF)



STIKINE AREA VICINITY MAP  
MAP AREA SHOWN IN DARK GREY



g:\projects\crane\_rowan\plots\docmaps\obml.map  
feismap.aml and obml.aml 07/01/98

Crane/Rowan Mountain Timber Harvest Draft EIS  
Appendix A



# Road Management Objectives

Project Crane and Rowan Mountain		System Kuiu	Land Use Designation TM
Route No 6401	Route Name Bull Buck	Begin Termini MP 8.24 ROAD 6402	End Termini SECTION 4
Begin MP 0	Length 1.03	Status Existing	

## General Design Criteria and Elements

Functional Class L	Service Life LI	Traffic Service Level D	Surface IMP	Width 14	Design Speed 10	Critical Vehicle log truck	Design Vehicle log truck
-----------------------	--------------------	----------------------------	----------------	-------------	--------------------	-------------------------------	-----------------------------

### Intended Purpose/Future Use

Access for silvicultural activities. Will be extended in the future to access timber in the valley to the south. Close road to minimize wildlife displacement and reduce maintenance needs.

## Maintenance Criteria

Operational Maintenance Level (Current or Planned Initial Condition)	3	Objective Maintenance Level (Desired Future Condition)	1
--	---	--	---

### Maintenance Narrative

Storage: remove or bypass all drainage structures to restore natural drainage patterns, add waterbars as needed to control runoff, re-vegetate. No fish timing req'd. to remove cmp at MP 0.25 Class II x-ing.

## Operation Criteria

Highway Safety Act:	No	Jurisdiction:	National Forest ownership
---------------------	----	---------------	---------------------------

### Travel Management Strategies

Encourage: N/A

Accept: Hikers, bicycles

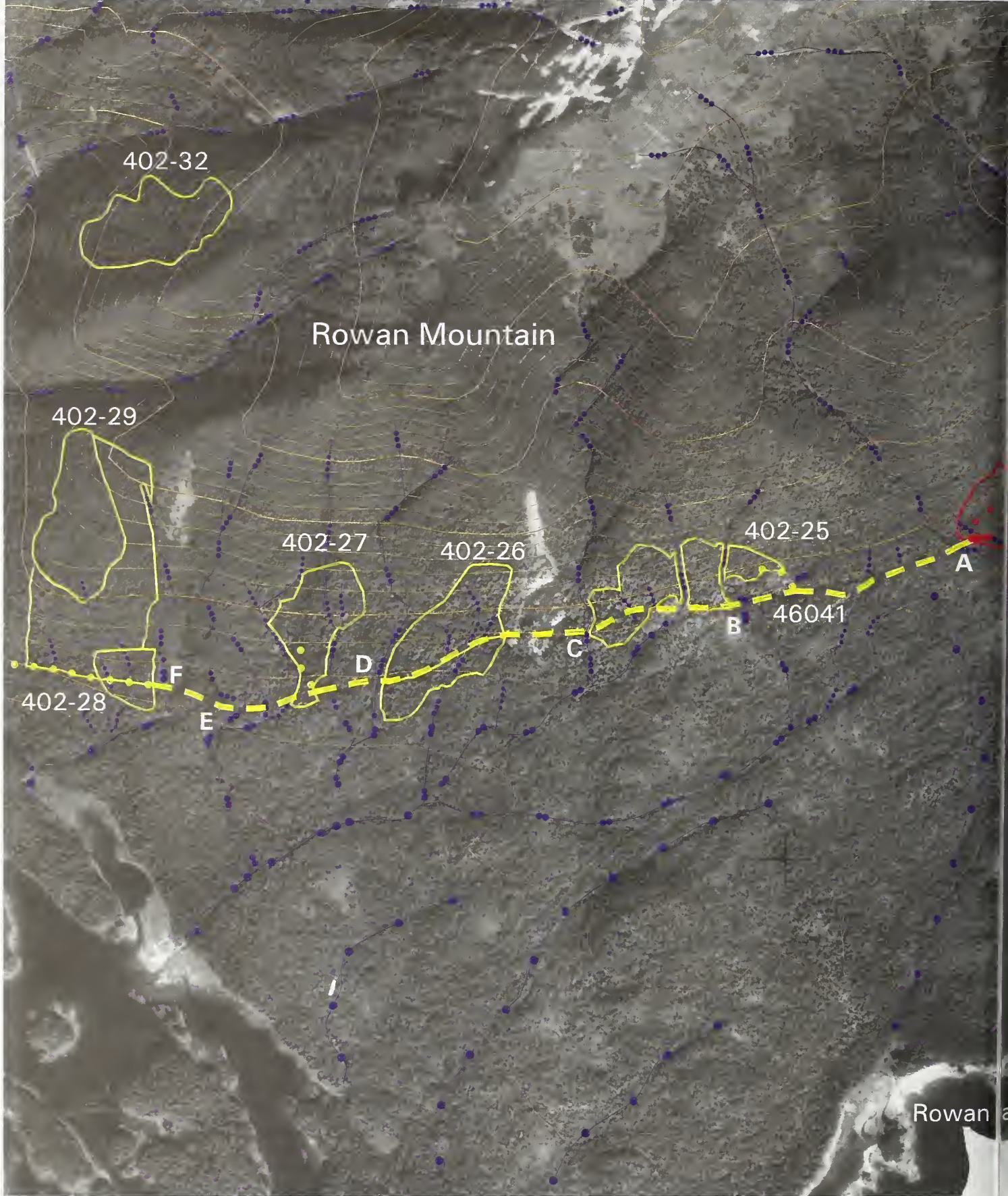
Discourage: Motorized vehicles

Prohibit: N/A

Eliminate: Standard passenger and high clearance vehicles.

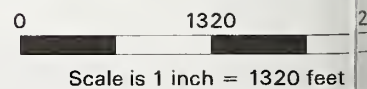
### Travel Management Narrative

By removing crossing structures, most motorized vehicle use will be eliminated. Determined individuals may find a way to use off road vehicles on this road, but will be discouraged by the difficulty. Restore crossings when needed in the future.



Contour Interval 100 ft

RMO464



# Road Management Objectives

Project	Crane and Rowan Mountain	System	Kuiu	Land Use Designation	TM
Route No	46041	Route Name	Behind Camp	Begin Termini	MP 1.36 ROAD 6404
				End Termini	Almost to Unit 402-24 N&E Kuiu
Begin MP	0	Length	0.59	Status	Existing

## General Design Criteria and Elements

Functional Class	Service Life	Traffic Service Level	Surface	Width	Design Speed	Critical Vehicle	Design Vehicle
L	LI	D	IMP	14	10	log truck	log truck

Intended Purpose/Future Use  
Access for general forest management and administration. Will be extended in the Rowan Release T.S.

## Maintenance Criteria

Operational Maintenance Level (Current or Planned Initial Condition)	2	Objective Maintenance Level (Desired Future Condition)	2
--	---	--	---

Maintenance Narrative  
Storm Proof: provide waterbars, rolling dips, outsloping, etc., to assure controlled runoff until any needed maintenance can be performed on the primary drainage system. Control roadside brush to maintain passage.

## Operation Criteria

Highway Safety Act:	No	Jurisdiction:	National Forest ownership
---------------------	----	---------------	---------------------------

### Travel Management Strategies

Encourage: N/A

Accept: High clearance vehicles, ATV's

Discourage: Standard passenger vehicles

Prohibit: N/A

Eliminate: N/A

Travel Management Narrative  
Public travel on this isolated system is very low. Only access is by barging private vehicles. Rough rock ramp at LTF discourages passenger vehicles. Public traffic is not expected to conflict with commercial use.

# Road Management Objectives

Project Crane and Rowan Mountain		System Kuiu	Land Use Designation TM
Route No 46041	Route Name Behind Camp	Begin Termini MP 0.59 existing Rd. 46041	End Termini Camp Creek crossing
Begin MP 0.59	Length 0.49	Status Planned	

## General Design Criteria and Elements

Functional Class L	Service Life LI	Traffic Service Level D	Surface IMP	Width 14	Design Speed 10	Critical Vehicle log truck	Design Vehicle log truck
-----------------------	--------------------	----------------------------	----------------	-------------	--------------------	-------------------------------	-----------------------------

### Intended Purpose/Future Use

Access for general forest management and administration. Allows standard motorized access to within ~2 miles of the end of the road system. To be built in the Rowan Release T.S.

## Maintenance Criteria

Operational Maintenance Level (Current or Planned Initial Condition)  Objective Maintenance Level (Desired Future Condition)

### Maintenance Narrative

Storm Proof: provide waterbars, rolling dips, outsloping, etc., to assure controlled runoff until any needed maintenance can be performed on the primary drainage system. Control roadside brush to maintain passage.

## Operation Criteria

Highway Safety Act:  Jurisdiction: National Forest ownership

### Travel Management Strategies

Encourage: N/A

Accept: High clearance vehicles, ATV's

Discourage: Standard passenger vehicles

Prohibit: N/A

Eliminate: N/A

### Travel Management Narrative

Public travel on this isolated system is very low. Only access is by barging private vehicles. Rough rock ramp at LTF discourages passenger vehicles. Public traffic is not expected to conflict with commercial use.

# Road Management Objectives

Project Crane and Rowan Mountain		System Kuiu		Land Use Designation TM
Route No 46041	Route Name Behind Camp	Begin Termini MP 1.08 of Planned 46041		End Termini East boundary Unit 402-28
Begin MP 1.08	Length 1.62	Status Opportunity		

## General Design Criteria and Elements

Functional Class L	Service Life LI	Traffic Service Level D	Surface IMP	Width 14	Design Speed 10	Critical Vehicle log truck	Design Vehicle log truck
-----------------------	--------------------	----------------------------	----------------	-------------	--------------------	-------------------------------	-----------------------------

### Intended Purpose/Future Use

Access for silvicultural activities. Will not be extended in the future, but additional timber sale opportunities exist along the road. Close road after sale to minimize wildlife displacement and reduce maintenance needs.

## Maintenance Criteria

Operational Maintenance Level (Current or Planned Initial Condition)	2	Objective Maintenance Level (Desired Future Condition)	1
--	---	--	---

### Maintenance Narrative

Storage: remove or bypass all drainage structures to restore natural drainage patterns, add waterbars as needed to control runoff, re-vegetate.

## Operation Criteria

Highway Safety Act:	No	Jurisdiction:	National Forest ownership.
---------------------	----	---------------	----------------------------

### Travel Management Strategies

Encourage: N/A

Accept: Hikers, bicycles

Discourage: Motorized vehicles

Prohibit: N/A

Eliminate: Standard passenger and high clearance vehicles

### Travel Management Narrative

By removing crossing structures, most motorized vehicle use will be eliminated. Determined individuals may find a way to use off road vehicles on this road, but will be discouraged by the difficulty. Restore crossings when needed in the future.

# Road Management Objectives

## Site Specific Design Criteria

### Road 46041

**ROAD LOCATION:** The main location objective is to follow the base of the Rowan Mountain ridge system, staying below the steep slopes, but above the forested wetlands when possible. Between Units 402-27 and 28 the road climbs up to reach a bench along the bottom of Unit 402-28. Climbing here avoids an alluvial area, then steep sideslopes (BMP 14.2). It also keeps the road above the 1000 foot beach buffer. The specified road ends just past the last crossing that requires design (Site F). The remaining 0.66 miles to the helicopter/cable landing in Unit 402-49 will be built as a temporary spur.

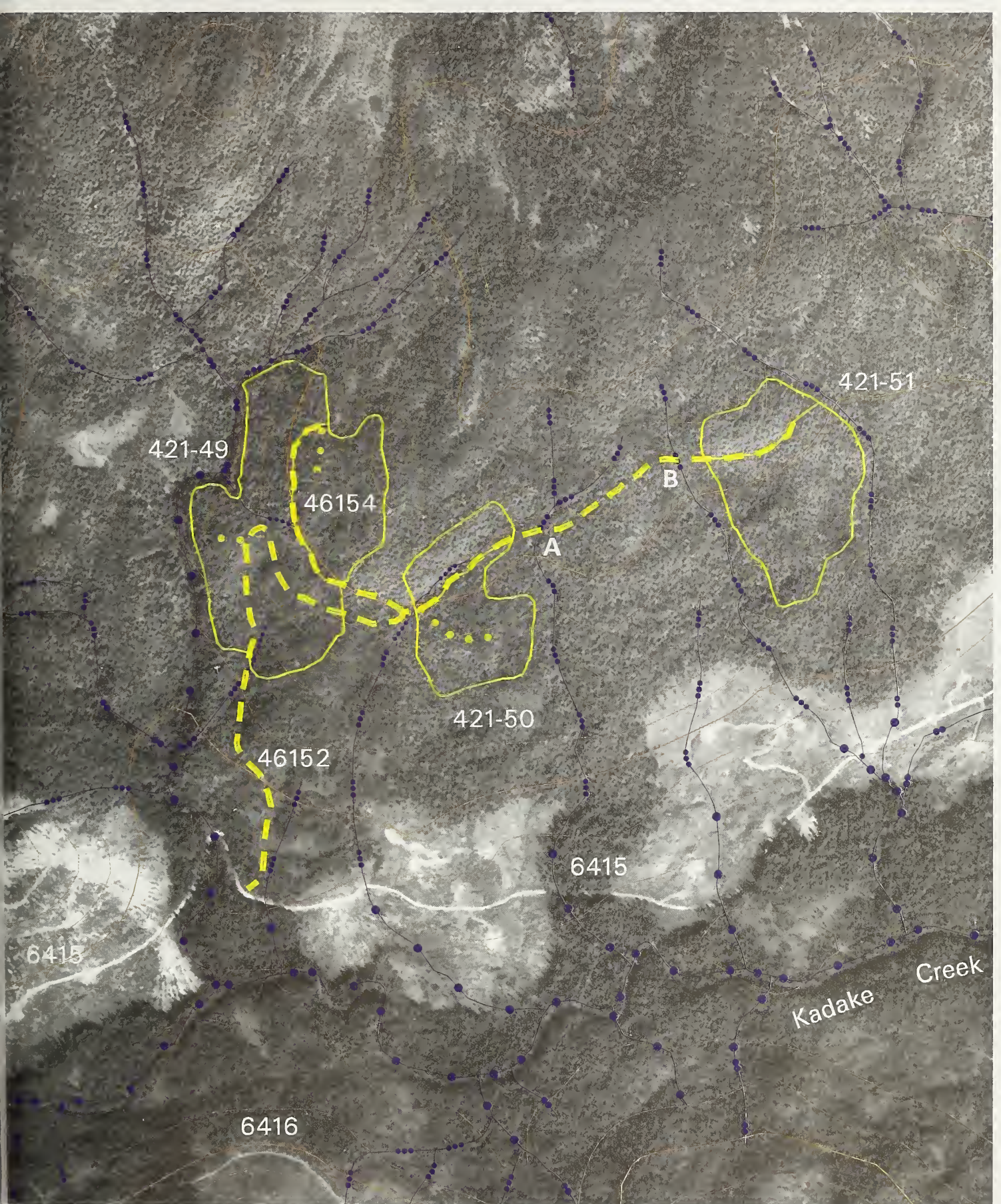
**WETLANDS:** The first half mile of the new construction crosses along the edge of a soil type mapped as muskeg/forested mosaic (BMP 12.5). The road is located here because construction on the gentle terrain will cause less environmental impacts than building on the steep sideslopes of Rowan Mountain.

**EROSION CONTROL:** An erosion control plan for construction and maintenance will be developed by the contractor and approved by the Contracting Officer (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded and fertilized (BMP 12.17,14.8)

**ROCK PITS:** During periods of high rainfall (as defined in current Regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movement (BMP 14.6). The area along the temporary spur between Units 402-28 and 49 has been identified as a visual or recreation concern. Quarries will not be located in this area.

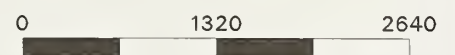
#### STREAM CROSSINGS:

- A) MP 1.12 AHMU 3 Channel Type HC2 BF Width 30 ft BF Depth 1 ft Incision 5-10 ft  
Substrate boulder, cobble, gravel Gradient 10% Structure 60' bridge Narrative: ~200 below bedrock falls, flashy stream, log jams above and below crossing. This is the main channel of the creek formerly used for the Rowan Bay logging camp's water supply. Located west end Unit 402-24. (Camp)
- B) MP 1.55 AHMU 2 Channel Type MM1 BF Width 4 ft BF Depth 1 ft Incision 3 ft  
Substrate silty gravel Gradient 1% Structure 36' cmp Narrative: Inlet near confluence of two smaller channels. No timing required, maintain fish passage. Located east end Unit 402-25. (Mugwump)
- C) MP 1.87 AHMU 3 Channel Type HC6 BF Width 12 ft BF Depth 2 ft Incision 10 ft  
Substrate bedrock, boulders, cobbles Gradient 6% Structure 12 m panel bridge Narrative: Rock chute w/18% gradient into crossing, 40' of 6% and cobbles, then a 10' falls below the site. Bedrock banks. Located west end of Unit 402-25. (Peterson)
- D) MP 2.29 AHMU 3 Channel Type HC3 BF Width 10 ft BF Depth 2 ft Incision 10 ft  
Substrate boulders, cobbles, gravel Gradient 10% up/15% down Structure 12 m panel bridge  
Narrative: Dry wash, 30' across at top of banks. Located west end of Unit 402-26. (Algor)
- E) MP 2.55 AHMU 3 Channel Type AF2/HC3 break BF Width 10 ft BF Depth 1.5 ft Incision 1.5 ft  
Substrate boulders, cobbles, gravel Gradient 4% Structure 60' cmp Narrative: Dry wash debris torrent deposit. Large fill will be required to hit the ridge nose on the west side of the crossing. Located between Unit 402-27 and 28. (Ramp)
- F) MP 2.72 AHMU 2 Channel Type HC3 BF Width 10 ft BF Depth 1 ft Incision 30 ft  
Substrate bedrock, boulders, cobbles Gradient 20% Structure 80' bridge Narrative: Old debris torrent down this V-notch, 40 yr. old spruce and alder on east side. Goes to AHMU 3 ~100 above crossing, no timing requirements. 75 ft across to good level sill locations, probably cut down approaches to make bridge fit. Located east boundary of Unit 402-28. (Torrent)



RMO46152

Contour Interval 100 ft



# Road Management Objectives

Project	Crane and Rowan Mountain		System	Kuiu	Land Use Designation	TM
Route No	46152	Route Name	Kadake Wind		Begin Termini	MP 5.86 Road 6415
					End Termini	Last landing Unit 421-51
Begin MP	0	Length	2.04	Status	Opportunity	

## General Design Criteria and Elements

Functional Class	Service Life	Traffic Service Level	Surface	Width	Design Speed	Critical Vehicle	Design Vehicle
L	LI	D	IMP	14	10	log truck	log truck

### Intended Purpose/Future Use

Access for silvicultural activities. Will be extended in the future, accessing timber along the slope to the east. Close road after sale to minimize wildlife displacement and reduce maintenance needs

## Maintenance Criteria

Operational Maintenance Level (Current or Planned Initial Condition)	2	Objective Maintenance Level (Desired Future Condition)	1
--	---	--	---

### Maintenance Narrative

Storage: remove or bypass all drainage structures to restore natural drainage patterns, add waterbars as needed to control runoff, re-vegetate.

## Operation Criteria

Highway Safety Act:	No	Jurisdiction:	National Forest ownership
---------------------	----	---------------	---------------------------

### Travel Management Strategies

Encourage: N/A

Accept: Hikers, bicycles

Discourage: Motorized vehicles

Prohibit: N/A

Eliminate: Standard passenger and high clearance vehicles.

### Travel Management Narrative

By removing crossing structures, most motorized vehicle use will be eliminated. Determined individuals may find a way to use off road vehicles on this road, but will be discouraged by the difficulty. Restore crossings when needed in the future.

# Road Management Objectives

---

## Site Specific Design Criteria Road 46152

**ROAD LOCATION:** The road gains elevation as rapidly as possible up gentle topography, then switches back and accesses the top of a mid-slope bench. There is one V-notch control point just east of Unit 421-50.

**WETLANDS:** The first 1500' past the junction with Rd. 6415 crosses through a soil type mapped as muskeg/forested mosaic (BMP 12.5). The road is located here because the ground is gaining elevation the steadiest along this route. Moving the road down into the timber to the west would have affected the stream buffer and caused a very steep grade to make up the elevation lost. Between Units 421-50 and 51 there is another 1500' segment that crosses a muskeg/forested mosaic soil type. This is a good bench location which avoids impacts to steeper slopes off of the forested wetland.

**EROSION CONTROL:** An erosion control plan for construction and maintenance will be developed by the contractor and approved by the Contracting Officer (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded and fertilized (BMP 12.17,14.8)

**ROCK PITS:** During periods of high rainfall (as defined in current Regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movement (BMP 14.6). No visual concerns along this location.

### STREAM CROSSINGS:

- A) MP 1.47 AHMU 3 Channel Type HC6 BF Width 8 ft BF Depth 1.5 ft Incision 15-20 ft  
Substrate bedrock, cobble Gradient 20% up/5% down Structure 48" cmp Narrative: Road grade is 15% through the crossing. Located just past east boundary Unit 420-50.
- B) MP 1.78 AHMU 3 Channel Type HC6 BF Width 6 ft BF Depth 1.5 ft Incision 20 ft  
Substrate boulder, cobble Gradient 15% Structure 48" cmp Narrative: Located just before west boundary of Unit 420-51.

# Road Management Objectives

Project Crane and Rowan Mountain		System Kuiu	Land Use Designation TM
Route No 46154	Route Name Kadake Wind Switchback	Begin Termini MP 1.15 Road 46152	End Termini North end Unit 421-49
Begin MP 0	Length 0.51	Status Opportunity	

## General Design Criteria and Elements

Functional Class L	Service Life LI	Traffic Service Level D	Surface IMP	Width 14	Design Speed 10	Critical Vehicle log truck	Design Vehicle log truck
-----------------------	--------------------	----------------------------	----------------	-------------	--------------------	-------------------------------	-----------------------------

### Intended Purpose/Future Use

Access for silvicultural activities. Will be extended in the future to access timber along the upper slope of the valley to the northwest, and possibly along the ridgetop. Close road to minimize wildlife displacement and reduce maintenance needs.

## Maintenance Criteria

Operational Maintenance Level (Current or Planned Initial Condition)	2	Objective Maintenance Level (Desired Future Condition)	1
--	---	--	---

### Maintenance Narrative

Storage: remove or bypass all drainage structures to restore natural drainage patterns, add waterbars as needed to control runoff, re-vegetate.

## Operation Criteria

Highway Safety Act:	No	Jurisdiction:	National Forest ownership
---------------------	----	---------------	---------------------------

### Travel Management Strategies

Encourage: N/A

Accept: Hikers, bicycles

Discourage: Motorized vehicles

Prohibit: N/A

Eliminate: Standard passenger and high clearance vehicles.

### Travel Management Narrative

By removing crossing structures, most motorized vehicle use will be eliminated. Determined individuals may find a way to use off road vehicles on this road, but will be discouraged by the difficulty. Restore crossings when needed in the future.

# Road Management Objectives

---

## Site Specific Design Criteria Road 46154

**ROAD LOCATION:** Road 46154 takes off with a switchback junction from MP 1.15 of Rd. 46152 (also proposed in this project). The switchback is on 20% sideslopes with the control being the curve must start before the Class 4 stream on the west boundary of Unit 420-50. The road then climbs to a bench running through the north portion of Unit 420-49. The road can continue on up the valley along this slope break in the future.

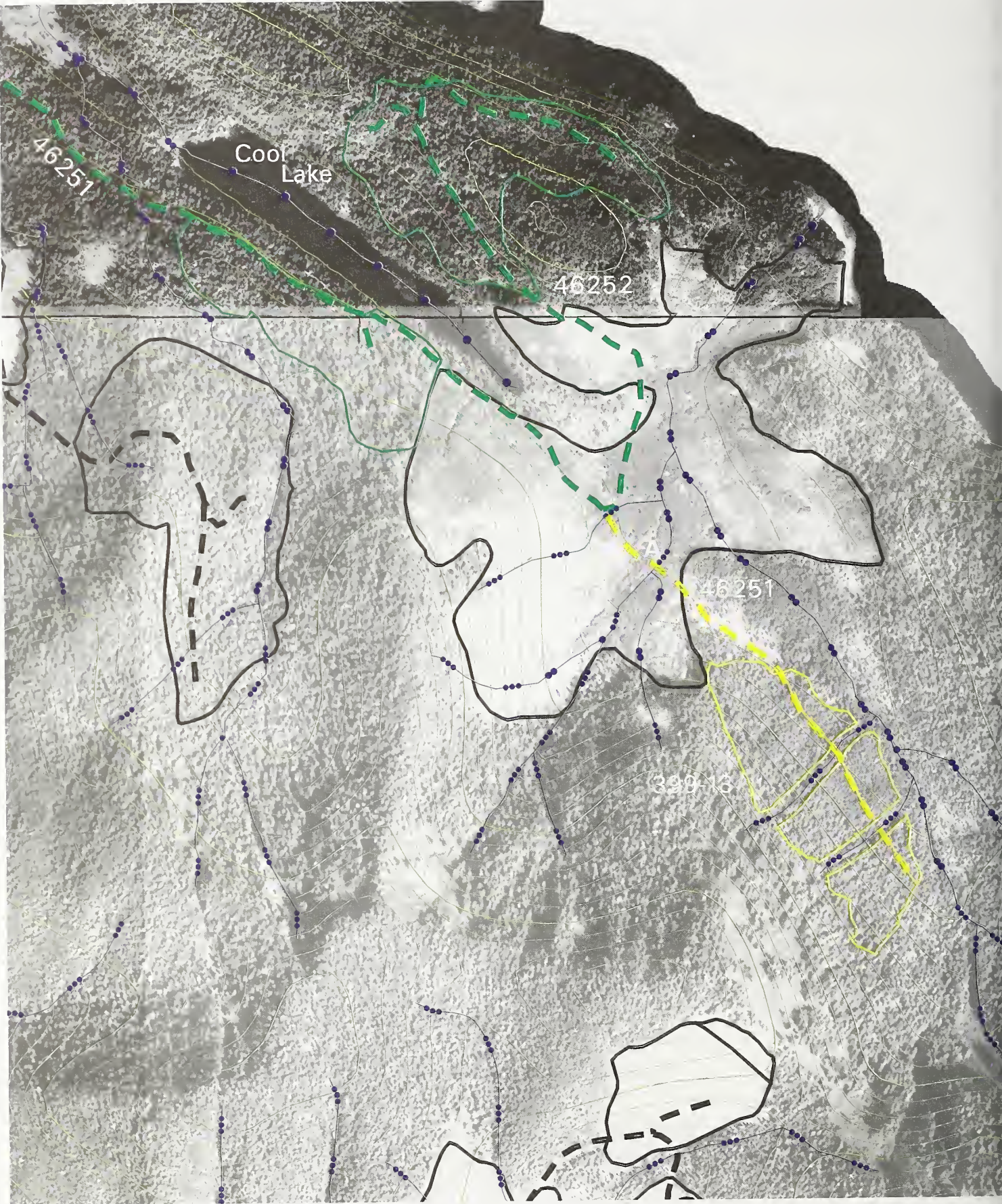
**WETLANDS:** The road crosses no mapped wetlands (BMP 12.5)..

**EROSION CONTROL:** An erosion control plan for construction and maintenance will be developed by the contractor and approved by the Contracting Officer (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded and fertilized (BMP 12.17,14.8)

**ROCK PITS:** During periods of high rainfall (as defined in current Regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movement (BMP 14.6). There are no visual concerns along this route.

### STREAM CROSSINGS:

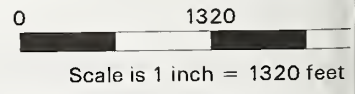
**Narrative:** There are no stream crossings that require site specific design consideration for volume of flow, fish habitat, or other design complexity.



Contour Interval 100 ft

RMO4

- Existing Roads
- Planned Roads
- NEPA Cleared Units
- Harvest Unit Boundary



# Road Management Objectives

Project Crane and Rowan Mountain		System Kuiu	Land Use Designation TM
Route No 46251	Route Name Cool Lake	Begin Termini MP 4.76 of Rd. 6425	End Termini Class II stream MP 1.02
Begin MP 0	Length 1.02	Status Planned	

## General Design Criteria and Elements

Functional Class L	Service Life LI	Traffic Service Level D	Surface IMP	Width 14	Design Speed 10	Critical Vehicle log truck	Design Vehicle log truck
-----------------------	--------------------	----------------------------	----------------	-------------	--------------------	-------------------------------	-----------------------------

### Intended Purpose/Future Use

Access for general forest management and administration. Allows standard motorized access to within ~2 miles of the end of the road system. To be built in Saginaw T.S.

## Maintenance Criteria

Operational Maintenance Level (Current or Planned Initial Condition)	2	Objective Maintenance Level (Desired Future Condition)	2
--	---	--	---

### Maintenance Narrative

Storm Proof: provide waterbars, rolling dips, outsloping, etc., to assure controlled runoff until any needed maintenance can be performed on the primary drainage system. Control roadside brush to maintain passage.

## Operation Criteria

Highway Safety Act:	No	Jurisdiction:	National Forest ownership
---------------------	----	---------------	---------------------------

### Travel Management Strategies

Encourage: N/A

Accept: High clearance vehicles, ATV's

Discourage: Standard passenger vehicles

Prohibit: N/A

Eliminate: N/A

### Travel Management Narrative

Public travel on this isolated system is very low. Only access is by barging private vehicles. Rough rock ramp at LTF discourages passenger vehicles. Public traffic in not expected to conflict with commercial use.

# Road Management Objectives

Project Crane and Rowan Mountain		System Kuiu		Land Use Designation TM
Route No 46251	Route Name Cool Lake	Begin Termini MP 1.02 of Planned 46251		End Termini Junct. planned Rd. 46152
Begin MP 1.02	Length 1.11	Status Planned		

## General Design Criteria and Elements

Functional Class L	Service Life LI	Traffic Service Level D	Surface IMP	Width 14	Design Speed 10	Critical Vehicle log truck	Design Vehicle log truck
-----------------------	--------------------	----------------------------	----------------	-------------	--------------------	-------------------------------	-----------------------------

### Intended Purpose/Future Use

Access for silvicultural activities. Close road to minimize wildlife displacement and reduce maintenance needs. To be built in Saginaw T.S.

## Maintenance Criteria

Operational Maintenance Level (Current or Planned Initial Condition)	2	Objective Maintenance Level (Desired Future Condition)	1
--	---	--	---

### Maintenance Narrative

Storage: remove or bypass all drainage structures to restore natural drainage patterns, add waterbars as needed to control runoff, re-vegetate. No fish timing req'd when removing Class II x-ing at MP 1.02

## Operation Criteria

Highway Safety Act:	No	Jurisdiction:	National Forest ownership
---------------------	----	---------------	---------------------------

### Travel Management Strategies

Encourage: N/A

Accept: Hikers, bicycles

Discourage: Motorized vehicles

Prohibit: N/A

Eliminate: Standard passenger and high clearance vehicles.

### Travel Management Narrative

By removing crossing structures, most motorized vehicle use will be eliminated. Determined individuals may find a way to use off road vehicles on this road, but will be discouraged by the difficulty. Restore crossings when needed in the future.

# Road Management Objectives

Project Crane and Rowan Mountain		System Kuiu	Land Use Designation TM
Route No 46251	Route Name Cool Lake	Begin Termini MP 2.13 of Planned 46251	End Termini Last landing Unit 399-13
Begin MP 2.13	Length 0.94	Status Opportunity	

## General Design Criteria and Elements

Functional Class L	Service Life LI	Traffic Service Level D	Surface IMP	Width 14	Design Speed 10	Critical Vehicle log truck	Design Vehicle log truck
-----------------------	--------------------	----------------------------	----------------	-------------	--------------------	-------------------------------	-----------------------------

### Intended Purpose/Future Use

Access for silvicultural activities. Will be extended in the future, crossing the creek and accessing timber up the valley to the west. Close road after sale to minimize wildlife displacement and reduce maintenance needs.

## Maintenance Criteria

Operational Maintenance Level (Current or Planned Initial Condition)	2	Objective Maintenance Level (Desired Future Condition)	1
--	---	--	---

### Maintenance Narrative

Storage: remove or bypass all drainage structures to restore natural drainage patterns, add waterbars as needed to control runoff, re-vegetate.

## Operation Criteria

Highway Safety Act:	No	Jurisdiction:	National Forest ownership
---------------------	----	---------------	---------------------------

### Travel Management Strategies

Encourage: N/A

Accept: Hikers, bicycles

Discourage: Motorized vehicles

Prohibit: N/A

Eliminate: Standard passenger and high clearance vehicles.

### Travel Management Narrative

By removing crossing structures, most motorized vehicle use will be eliminated. Determined individuals may find a way to use off road vehicles on this road, but will be discouraged by the difficulty. Restore crossings when needed in the future.

# Road Management Objectives

---

## Site Specific Design Criteria

### Road 46251

ROAD LOCATION: Road 46251 will be constructed to MP 2.13 in the Saginaw T.S. New construction continues to the southeast through an existing managed stand, where the road crosses the only stream that needs a designed crossing structure (Site A). At the edge of the managed stand, the road begins to run along toe of a forested slope, which is the location objective through Unit 399-13.

WETLANDS: The first 1300' of the new construction past the managed stand crosses along the upper edge of a soil type mapped as muskeg/forested mosaic (BMP 12.5). The road is located here because construction on the gentle terrain will cause less environmental impacts than building on the steeper forested sideslopes.

EROSION CONTROL: An erosion control plan for construction and maintenance will be developed by the contractor and approved by the Contracting Officer (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded and fertilized (BMP 12.17,14.8)

ROCK PITS: During periods of high rainfall (as defined in current Regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movement (BMP 14.6). There are no visual concerns along this route.

#### STREAM CROSSINGS:

- A) MP 2.25 AHMU 3 Channel Type HC5 BF Width 12 ft BF Depth 1.5 ft Incision 5 ft  
Substrate boulder, cobble Gradient 15% Structure 12 m panel bridge Narrative: Flashy stream moving a lot of bedload up to 1 ft. in diameter.

# Road Management Objectives

Project	Crane and Rowan Mountain	System	Kuiu	Land Use Designation	TM		
Route No	46252	Route Name	North Cool Lake	Begin Termini	MP 2.13 of Planned 46251	End Termini	West landing Unit 399-16
Begin MP	0	Length	1.1	Status	Planned		

## General Design Criteria and Elements

Functional Class	Service Life	Traffic Service Level	Surface	Width	Design Speed	Critical Vehicle	Design Vehicle
L	LI	D	IMP	14	10	log truck	log truck

### Intended Purpose/Future Use

Access for silvicultural activities. Will be extended in the future to the end of the ridge to the west. Close road to minimize wildlife displacement and reduce maintenance needs.

## Maintenance Criteria

Operational Maintenance Level (Current or Planned Initial Condition)	2	Objective Maintenance Level (Desired Future Condition)	1
--	---	--	---

### Maintenance Narrative

Storage: remove or bypass all drainage structures to restore natural drainage patterns, add waterbars as needed to control runoff, re-vegetate.

## Operation Criteria

Highway Safety Act:	No	Jurisdiction:	National Forest ownership
---------------------	----	---------------	---------------------------

### Travel Management Strategies

Encourage: N/A

Accept: Hikers, bicycles

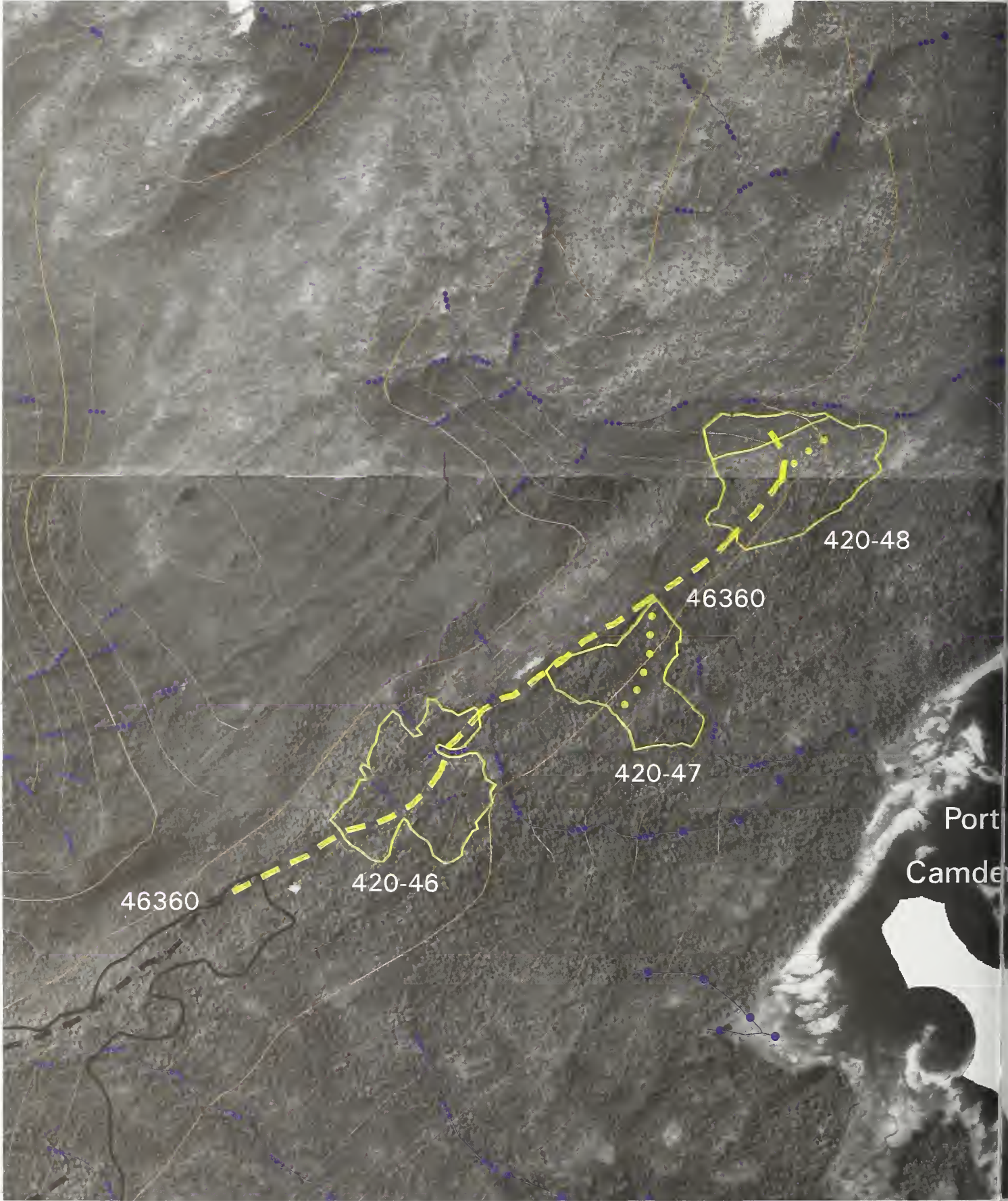
Discourage: Motorized vehicles

Prohibit: N/A

Eliminate: Standard passenger and high clearance vehicles.

### Travel Management Narrative

By removing crossing structures, most motorized vehicle use will be eliminated. Determined individuals may find a way to use off road vehicles on this road, but will be discouraged by the difficulty. Restore crossings when needed in the future.



- Contour Interval 100 ft
- Existing Roads
- Planned Roads
- Harvest Unit Boundary

0 1320  
Scale is 1 inch = 1320 feet

# Road Management Objectives

Project Crane and Rowan Mountain		System Kuiu	Land Use Designation TM
Route No 46360	Route Name Pinnacles	Begin Termini MP 3.43 ROAD 6428	End Termini Junct. spur left at MP 2.34
Begin MP 0	Length 2.34	Status Existing	

## General Design Criteria and Elements

Functional Class L	Service Life LI	Traffic Service Level D	Surface IMP	Width 14	Design Speed 10	Critical Vehicle log truck	Design Vehicle log truck
-----------------------	--------------------	----------------------------	----------------	-------------	--------------------	-------------------------------	-----------------------------

### Intended Purpose/Future Use

Access for general forest management and administration. Allows standard motorized access to within ~2 miles of the end of the road system.

## Maintenance Criteria

Operational Maintenance Level (Current or Planned Initial Condition)	3	Objective Maintenance Level (Desired Future Condition)	2
--	---	--	---

### Maintenance Narrative

Storm Proof: provide waterbars, rolling dips, outsloping, etc., to assure controlled runoff until any needed maintenance can be performed on the primary drainage system. Control roadside brush to maintain passage.

## Operation Criteria

Highway Safety Act:	No	Jurisdiction:	National Forest ownership
---------------------	----	---------------	---------------------------

### Travel Management Strategies

Encourage: N/A

Accept: High clearance vehicles, ATV's

Discourage: Standard passenger vehicles

Prohibit: N/A

Eliminate: N/A

### Travel Management Narrative

Public travel on this isolated system is very low. Only access is by barging private vehicles. Rough rock ramp at LTF discourages passenger vehicles. Public traffic is not expected to conflict with commercial use.

## Road Management Objectives

Project Crane and Rowan Mountain		System Kuiu	Land Use Designation TM
Route No 46360	Route Name Pinnacles	Begin Termini Jnct spur left at MP 2.34	End Termini MP 3.20 SEIS unit 420-2
Begin MP 2.34	Length 0.86	Status Existing	

### General Design Criteria and Elements

Functional Class L	Service Life LI	Traffic Service Level D	Surface IMP	Width 14	Design Speed 10	Critical Vehicle log truck	Design Vehicle log truck
-----------------------	--------------------	----------------------------	----------------	-------------	--------------------	-------------------------------	-----------------------------

Intended Purpose/Future Use

Access for silvicultural activities. Close road to minimize wildlife displacement and reduce maintenance needs.

### Maintenance Criteria

Operational Maintenance Level (Current or Planned Initial Condition)	1	Objective Maintenance Level (Desired Future Condition)	1
--	---	--	---

Maintenance Narrative

Storage: remove or bypass all drainage structures to restore natural drainage patterns, add waterbars as needed to control runoff, re-vegetate. Currently blocked by slump at MP 2.57.

### Operation Criteria

Highway Safety Act: No Jurisdiction: National Forest ownership

#### Travel Management Strategies

Encourage: N/A

Accept: Hikers, bicycles

Discourage: Motorized vehicles

Prohibit: N/A

Eliminate: Standard passenger and high clearance vehicles.

Travel Management Narrative

By removing crossing structures, most motorized vehicle use will be eliminated. Determined individuals may find a way to use off road vehicles on this road, but will be discouraged by the difficulty. Restore crossings when needed in the future.

# Road Management Objectives

Project Crane and Rowan Mountain		System Kuiu	Land Use Designation TM
Route No 46360	Route Name Pinnacles	Begin Termini MP 3.2 of existing 46360	End Termini North landing Unit 402-48
Begin MP 3.2	Length 1.48	Status Opportunity	

## General Design Criteria and Elements

Functional Class L	Service Life LI	Traffic Service Level D	Surface IMP	Width 14	Design Speed 10	Critical Vehicle log truck	Design Vehicle log truck
-----------------------	--------------------	----------------------------	----------------	-------------	--------------------	-------------------------------	-----------------------------

### Intended Purpose/Future Use

Access for silvicultural activities. Will be extended in the future across the creek to the north for harvest up to the Kadake Bay Old Growth boundary. Close road to minimize wildlife displacement and reduce maintenance needs.

## Maintenance Criteria

Operational Maintenance Level (Current or Planned Initial Condition)	2	Objective Maintenance Level (Desired Future Condition)	1
--	---	--	---

### Maintenance Narrative

Storage: remove or bypass all drainage structures to restore natural drainage patterns, add waterbars as needed to control runoff, re-vegetate.

## Operation Criteria

Highway Safety Act:	No	Jurisdiction:	National Forest ownership
---------------------	----	---------------	---------------------------

### Travel Management Strategies

Encourage: N/A

Accept: Hikers, bicycles

Discourage: Motorized vehicles

Prohibit: N/A

Eliminate: Standard passenger and high clearance vehicles.

### Travel Management Narrative

By removing crossing structures, most motorized vehicle use will be eliminated. Determined individuals may find a way to use off road vehicles on this road, but will be discouraged by the difficulty. Restore crossings when needed in the future.

# Road Management Objectives

---

## Site Specific Design Criteria

### Road 46360

**ROAD LOCATION:** The main location objective is to follow the bench at ~800 elevation on the west side of Port Camden. It is believed that the bench is the top of a large "block glide" which resulted in a feature several hundred acres in size moving downslope. Geotech input indicates that due to the large scale of the feature the road along the top will not affect the stability of the area. The main control point is the head of a major V-notch that ends at the northeast corner of Unit 420-46.

**WETLANDS:** The road crosses 700 ft. of soiltype mapped as a forested wetland/upland mosaic between Units 420-46 and 420-47. Along the northeast corner of Unit 420-47, 500 ft. of forested wetland is crossed. (BMP 12.5). The road is located here because it is a good bench location and construction on the gentle terrain will cause less environmental impacts than building on the steeper non-wetland sideslopes.

**EROSION CONTROL:** An erosion control plan for construction and maintenance will be developed by the contractor and approved by the Contracting Officer (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded and fertilized (BMP 12.17,14.8)

**ROCK PITS:** During periods of high rainfall (as defined in current Regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movement (BMP 14.6). The entire length of this road has been identified as a visual or recreation concern. In addition, since the road is in an area of volcaniclastic soils, a soil scientist or geotech will be involved in the location of the quarry.

### STREAM CROSSINGS:

**Narrative:** There are no stream crossings that require site specific design consideration for volume of flow, fish habitat, or other design complexity. Two streams in Unit 420-46 go to very low gradient when they hit the bench in the middle of the unit. 36" cmp's will easily handle the flow of these streams.

# **Appendix B**

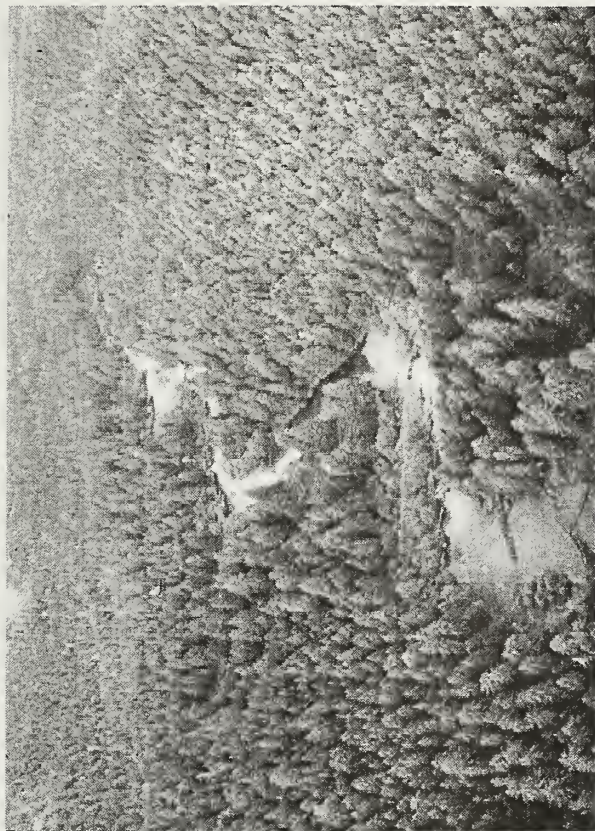
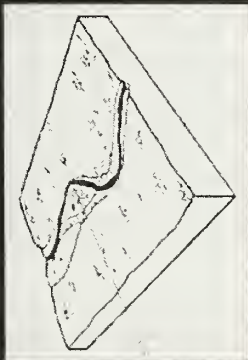
## **Riparian Standards and Guidelines**

A. J. M. S. A.

1915

1915

# FLOOD PLAIN PROCESS GROUP



## DESCRIPTION

Flood Plain and Glacial Outwash channels are associated with the valley bottom flood plain landform. These two process groups contain low gradient sinuous singular or anabranching channels. Braided channels are more prevalent in the Glacial Outwash. Mountain slope runoff and ground water discharge control stream flow in the FP group while glacial melt controls flow in the glacial outwash process group. Peak flows may occur in the spring and fall in the floodplain process group while in the summer for the glacial outwash group. Sediment deposition is the dominant process in both groups. Substrate material ranges from sand to cobble size material in both groups. Floodplains support standing old growth spruce with heights up to 130 feet. Downed wood provides nurse logs for regeneration, sediment retention, and infiltration. Floodplain width may exceed 200 feet on FP4 and FP5 channels, but are generally less than 200 feet on FP3 channels. These areas are typically highly productive for fish. Large wood and off channel rearing areas are of particular significance as habitat features. Early successional forest species, such as black cottonwood, are common in the glacial outwash process group.

## STREAM CLASS / ACTIVITY

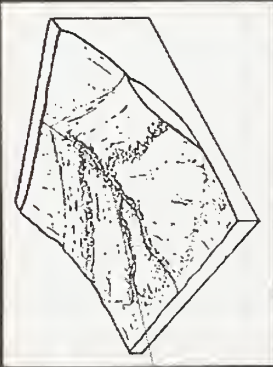
### I, II (direct)/Timber Harvest

No commercial timber harvest within 100 feet of class I streams and class II streams that flow directly into class I streams. Although not required by the Tongass Timber Reform Act, no commercial timber harvest in the floodplain until the completion of watershed analysis. No programmed commercial timber harvest in the Riparian Management Area (greatest of floodplain, riparian vegetation or soils, riparian associated wetland fens, or 130 feet (the height of one site-potential tree)). Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

### II (non-direct), III/Timber Harvest

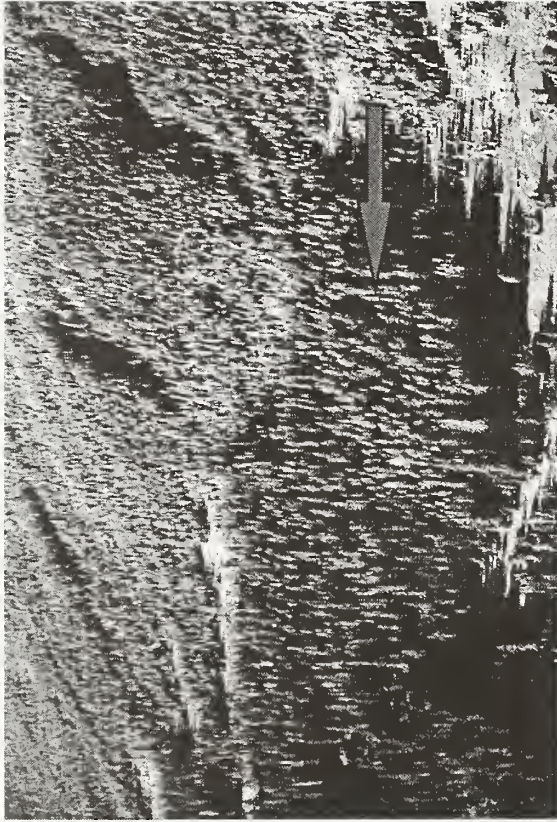
No programmed commercial timber harvest in the Riparian Management Area (greatest of floodplain, riparian vegetation or soils, riparian associated wetland fens, or 130 feet (the height of one site-potential tree)). Manage an appropriate distance beyond the no harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

## ALLUVIAL FAN PROCESS GROUP



### DESCRIPTION

Alluvial fan channels flow directly over the alluvial fan landform. These are dynamic multi-branched channels that periodically change course within the landform. Stream gradient ranges from 1 to 3 percent on the lower half of the alluvial fan and increases toward the fan apex. The alluvial fan channel is associated with high gradient contained channels; therefore streamflow is dependent on mountain slope runoff. Groundwater discharge is also significant. Surface flow may be intermittent as substrate consists of sand to cobble size material. During low flow periods stream flow may run subsurface in the middle section of the alluvial fan and emerge on the lower section. Aggradation of material is the dominant process on the alluvial fan and fine sediment may be deposited in the low gradient section. The active channels on alluvial fans often include multiple high flow channels and unvegetated gravel or cobble outwash lobes with ill-defined channel banks. Alluvial fans typically support large spruce with diameters (DBH) of 30" and have average site-potential tree heights of 140 feet. Downed wood serves as nurse logs for regeneration.



### STREAM CLASS / ACTIVITY

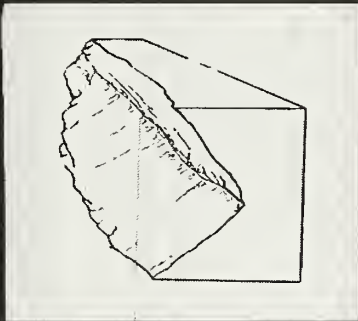
#### I, II (direct)/Timber Harvest

No commercial timber harvest within 100 feet of class I streams and class II streams that flow directly into class I streams. No programmed commercial timber harvest within the Riparian Management Area, which is the greater of the active portion of the alluvial fan or 140 feet (the height of one site-potential tree) from the current channel(s). Manage across the remainder of the fan (no more than 10% of the fan harvested in a 30 year period) with the objective of leaving large trees within the stand for future recruitment to stream channels.

#### II (non-direct), III/Timber Harvest

No programmed commercial timber harvest within the Riparian Management Area, which is the greater of the active portion of the alluvial fan or 140 feet (the height of one site-potential tree) from the current channel(s). Manage across the remainder of the fan (no more than 10% of the fan harvested in a 30 year period) with the objective of leaving large trees within the stand for future recruitment to stream channels.

## MOD GRADIENT/ MIXED CONTROL



### DESCRIPTION

These channels are commonly found in transition zones between high gradient contained streams and floodplain channels. They are located in narrow valleys, foot-slopes or sloping and rolling lowlands. Stream channel gradients range from 2 to 6 percent. Channel containment is variable as structural control may be intermittent or only along one bank. Overall channel pattern is straight. Stream flow is dependent upon mountain slope runoff and the sediment regime is balanced (input equals output). Channel substrate ranges from coarse gravel to boulder size material. Typical site potential tree height is 120 feet.



### STREAM CLASS / ACTIVITY

#### I, II (direct)/Timber Harvest

No commercial timber harvest within 100 feet of class I streams and class II streams that flow directly into class I streams. No programmed commercial timber harvest in the Riparian Management Area(greatest of floodplain, riparian vegetation or soils, riparian associated wetland fens, or 120 feet(the height of one site-potential tree)). Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area(pay special attention to the area within one site-potential tree height of the Riparian Management Area).

#### II (non-direct), III/Timber Harvest

No programmed commercial timber harvest in the Riparian Management Area(greatest of floodplain, riparian vegetation or soils, riparian associated wetland fens, or 120 feet(the height of one site-potential tree)). Manage an appropriate distance beyond the no harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area(pay special attention to the area within one site-potential tree height of the Riparian Management Area).

## MOD GRADIENT/ CONTAINED

PG



### DESCRIPTION

Moderate Gradient Contained channels are associated with sloping or rolling lowlands. Stream gradient ranges from 2 to 6 percent for these singular, straight and entrenched channels. Stream flow is dependent upon mountain slope runoff. Sediment is transported through these channels. Substrate is dominated by cobble, boulder and bedrock material. Habitat is often limited by stable large wood structures. Riparian vegetation communities are varied. Riparian width, including floodplain and sideslope breaks, reach 60 to 70 feet. A site potential tree height is 100 feet.



### STREAM CLASS / ACTIVITY

#### I and II's (direct)/Timber Harvest

No commercial timber harvest within 100 feet of class I streams and class II streams that flow directly into class I streams. No programmed commercial timber harvest within the remainder of the Riparian Management Area, defined as within the channel sideslope break. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

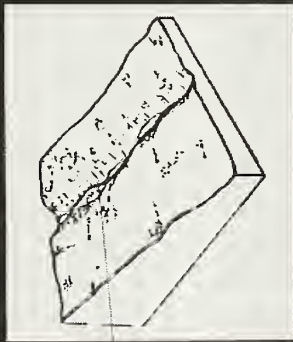
#### II's (non-direct)/Timber Harvest

No programmed commercial timber harvest within 100' or within the channel sideslope break, whichever is greater. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

#### III/Timber Harvest

No programmed commercial timber harvest within the Riparian Management Area, defined as the side-slope break. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

## LARGE CONTAINED PROCESS GROUP



### DESCRIPTION

Large Contained channels are associated with canyons or sloping lowlands. These are low gradient (less than 3 percent), singular, straight and entrenched channels with gravel to bedrock substrate. Sediment regime balances input with output. Stream flow is dependent upon mountain slope or lowland runoff. Habitat is often limited by a scarcity of stable large wood structures. Riparian vegetation communities are varied. Riparian width, including flood plain and sideslope breaks reach 150 feet (LC1) to 190 feet (LC2). A site potential tree reaches an average height of 100 feet.



### STREAM CLASS / ACTIVITY

#### I and II's (direct)/Timber Harvest

No commercial timber harvest within 100 feet of class I streams and class II streams that flow directly into class I streams. No programmed commercial timber harvest within the Riparian Management Area, defined as within the channel sideslope break. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

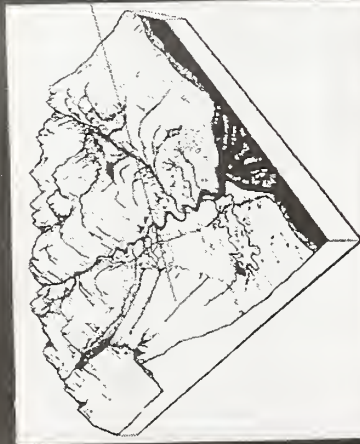
#### II's (non-direct)/Timber Harvest

No programmed commercial timber harvest within the Riparian Management Area, defined as within 100 feet of the stream or the top of the side-slope break, whichever is greater. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

#### III/Timber Harvest

No programmed commercial timber harvest within the Riparian Management Area, defined as the side-slope break. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

## HIGH GRADIENT/ CONTAINED PG



### DESCRIPTION

High Gradient Contained channels are located on mountain slopes. These are singular straight incised channels with steep slopes and channel gradients greater than 6 percent. Stream flow is dependent upon mountain slope runoff and may be intermittent. Sediment is readily transported through these channels. Substrate material ranges from cobble to bedrock. Riparian Management Areas include incised channels. Hemlock series dominates vegetation although spruce is also common. Some streams have intermittent flows. Steep gradients (>6%) limit fish capability. Typical site-potential tree height is 120 feet.



### STREAM CLASS / ACTIVITY

#### I, II (direct)/Timber Harvest

No commercial timber harvest within 100 feet of class I streams and class II streams that flow directly into class I streams. No programmed commercial timber harvest within the Riparian Management Area, defined as within 100 feet of the stream or to the top of the V-notch (side-slope break), whichever is greater. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

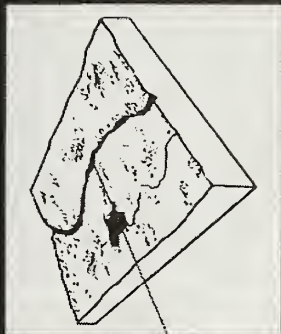
#### II (non-direct)/Timber Harvest

No programmed commercial timber harvest within the Riparian Management Area, defined as within 100 feet of the stream or the top of the V-notch (side-slope break), whichever is greater. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

#### III/Timber Harvest

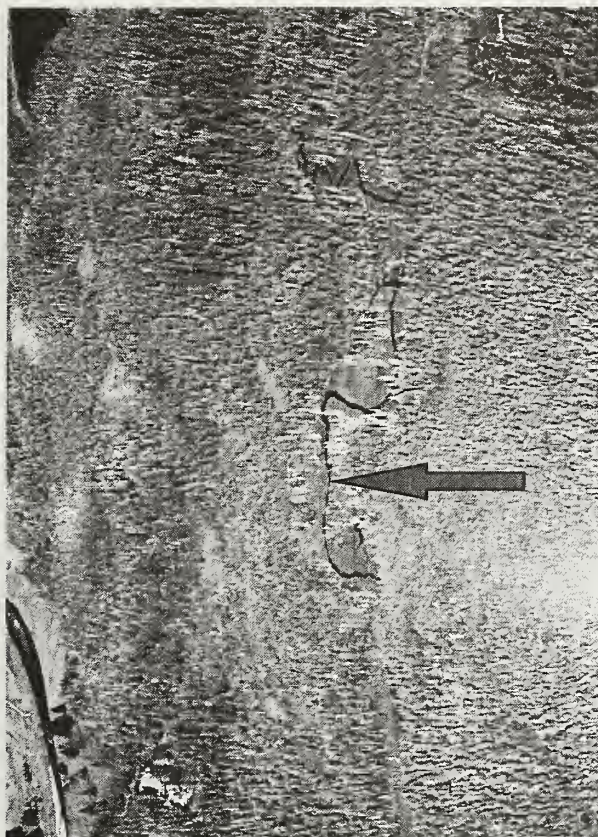
No programmed commercial timber harvest within the Riparian Management Area, defined as the V-notch (side-slope break). Following watershed analysis, Riparian Management Areas which become available for timber harvest will be converted from nonsuitable to suitable forested lands. (On a forest-wide basis, it is anticipated that this change will occur along up to 25% of the class III streams in this process group. Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within

## PALUSTRINE PROCESS GROUP



### DESCRIPTION

Palustrine channels are associated with lowland landforms and wetlands. Channel gradients are less than 1 percent. Palustrine channels are singular and sinuous. Stream flow is dependent on peatland and lowland runoff. Sediment storage is the dominant process. Substrate material ranges from fine organic material to coarse gravel. Riparian vegetation includes mixed conifer, shore pine, and non-forest. Site-potential tree height is generally less than 85'.



### STREAM CLASS / ACTIVITY

#### I & II (direct)/Timber Harvest

No commercial timber harvest within 100 feet of class I streams and class II streams that flow directly into class I streams. No programmed commercial timber harvest in the Riparian Management Area (greatest of floodplain, riparian vegetation or soils or riparian associated wetland fens). Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

#### II (non-direct)/Timber Harvest

No programmed commercial timber harvest in the Riparian Management Area (greatest of floodplain, riparian vegetation or soils or riparian associated wetland fens). Manage an appropriate distance beyond the no-harvest zone to provide for a reasonable assurance of windfirmness of the Riparian Management Area (pay special attention to the area within one site-potential tree height of the Riparian Management Area).

#### III/Timber Harvest

Consider no harvest (or limited harvest) areas to benefit water quality or palustrine-associated wildlife species.

## EXAMPLES OF CLASS 4 STREAMS

Class IV streams are defined as other intermittent, ephemeral, and small perennial channels with insufficient flow or sediment transport capabilities to have an immediate influence on downstream water quality or fish habitat capability. These streams generally are shallowly incised into the surrounding hillslope. Stream Class IV will be treated as part of the hillside under slope stability standards and guidelines (see Soil and Water Forest-wide Standards and Guidelines). Apply Best Management Practices.

Class IV streams have bankfull widths between 1-5 feet and incision is less than 15 feet. Due to their short length and difficulty in accurately mapping them, some Class IV streams do not appear on unit cards but will be located and flagged during unit layout and will appear on sale area maps along with the appropriate protection measures.



# **Appendix C**

## **Comments on the Draft EIS**



## Draft EIS Commentors

Name	Affiliation or Address
1. Rebecca Knight	Narrows Conservation Coalition
2. Marc Wheeler	Southeast Alaska Conservation Council
3. Doug Mutter	USDI, Office of Environmental Policy & Compliance
4. Jennifer R. Garland	Division of Governmental Coordination
5. Kevin J. Hanley	Department of Environmental Conservation
6. Joseph D. Sebastian	Point Baker
7. Jeffery K. Towner	Department of the Army, Corps of Engineers
8. Richard B. Parkin	US Environmental Protection Agency
9. Thomas S. Waldo	Earthjustice Legal Defense Fund
10. Mike A. Jackson	Organized Village of Kake
11. Jack E. Phelps	Alaska Forest Association
12. John Talberth	Forest Guardians
13. Susan B. Fruchter	National Oceanic & Atmospheric Administration
14. Brian Brown	Silver Bay Logging



NARROWS CONSERVATION COALITION

P.O. BOX 1331  
PETERSBURG, AK. 99833

PHONE AND FAX (907) 772-9391  
March 26, 1998

Everett Kissinger, ID Team Leader  
USDA Forest Service, Stikine Area  
Tongass National Forest  
PO Box 309  
Petersburg, AK 99833

MAR 26 1998

Petersburg, AK

re: Crane and Rowan Mountain Timber Sales DEIS Comments

Dear Mr. Kissinger:

Following are Narrows Conservation Coalition (NCC) comments on the Crane-Rowan Mountain Timber Sales Draft Environmental Impact Statement (DEIS). NCC is a grassroots community based conservation organization based in the Petersburg/Kupreanof area. We are interested in the ecological integrity of our community and region in Southeast Alaska. NCC's members include subsistence users, tourism and recreation business owners, commercial and sport fishermen, and sport hunters and professional guides, as well as other members of our community. We are united in our concern for the welfare of the Tongass and our quality of life.

We appreciate the opportunity to comment on this proposed timber sale.

GENERAL COMMENTS

We applaud the agency for trying something new in the form of diameter limit cutting practices, and hope to see many future variations on this theme, including even more retention in individual units.

However, Review of the Crane/Rowan Mountain Timber Sales DEIS reveals a noticeable departure, in many cases, of the in-depth analysis presented in previous Stikine Area EIS's. For instance, although the proposed project area contributes significantly to commercial fisheries, there is no map provided that depicts, Class I-IV streams in the project area, and likewise there is virtually no comprehensive, and well organized analysis of the impacts to the fisheries resource. In the era of AFHA and better riparian standards, we seriously question this omission. Also, there are no maps provided depicting important deer winter range, in relation to cutting units and roads. These are but two examples of the lack of important relevant information.

We suspect, that in your rush to produce this document, combined

with the recent downsizing of Stikine Area staff and no appreciable reduction in timber sale preparation needs, much information was simply left out. This also may be the consequence of combining the Affected Environment and Environmental Effects chapters. Please separate these chapters and include in future documents, at least the level of information provided in previous Stikine Area EIS's.

#### PURPOSE AND NEED

We seriously question the "need" to supply timber in the round to industry - a practice that is currently commonplace on the Tongass - to the tune of 80% plus of round log exports for the region in 1997. Likewise, as with previous timber sales on the Stikine Area, we remain concerned that the agency has once again, predetermined the timber volume to be extracted from the proposed project area, prior to the environmental analysis. This practice turns timber sale planning on it's head, puts the cart before the horse, and likewise violates NFMA.

The purpose and need described for the Crane and Rowan Mountain timber sale (DEIS 1-8) is, "to respond to the goals and objectives identified by the Forest Plan and to move the project area towards the desired future condition." This purpose and need ignores the 18 "broad and permissive" forest goals and objectives described in the 1997 TLMP and instead focuses only on those goals and objectives that sanction logging of approximately 24 MMBF and construction of 8 miles of road.

For example, the DEIS (at 1-8), is limited to fulfilling only a narrow range of the forestwide goals, ie. :

*"To maintain and promote industrial wood production from suitable timber lands, providing a continuous supply of wood to meet society's needs*

*To manage these lands for sustained long-term timber yields.*

*To seek to provide a supply of timber from the Tongass National Forest which meets the annual and planning-cycle market demand, consistent with the standards and guidelines of this Land Use Designation."*

The agency does not have the discretion to select only certain TLMP goals and objectives for this proposed sale while ignoring others. This violates NFMA. Also, by ignoring goals and objectives that do not support industrial scale timber extraction, your agency misses an opportunity to incorporate the adaptive ecosystem management fundamentals and collaborative stewardship hailed in your TLMP as the cutting edge of modern forest management.

Further evidence that the FS has predetermined the amount of

timber to be cut from the Crane Rowan Mountain area is found in the agency's own timber sale schedule. According to Table 2 of Appendix A to the Control Lake SDEIS, the FS plans to cut 23 MMBF of timber from the project area - coincidentally about the same amount of volume identified in the preferred alternative. Likewise, the acreage included in the diameter limit units (897 ac.) were apparently increased substantially over other alternatives where clearcutting was the predominate method of harvest, in order to squeeze out the predetermined volume from the sale area. This prevents the Forest Service from giving meaningful consideration to any alternative that cuts less volume from the sale area than the predefined 24 mmbf.

Finally, the courts have previously found that the "result-driven decision-making process" is illegal (731 F. Supp 970, 989 (D. Colo. 1989), ie.: situations where "the Forest Service had first established timber production goals and then formulated its 'alternatives' in a manner guaranteeing that the Service planners would reach these goals...does not constitute a consideration of a broad range of alternatives as contemplated by 36 CFR Sec 219.12 (f)."

#### NO-ACTION ALTERNATIVE

According to the DEIS (at 2-14 ) the no-action alternative is provided "so that you can see the changes that the other alternatives have on the social, physical, and biological environment." Apparently, the FS does not consider the no-action alternative a viable alternative if it is only to be used as a benchmark for comparison. Nowhere in the EIS is there meaningful consideration of the no-action alternative and as a result the agency has artificially restricted the range of alternatives. The FS has relied on a restricted and predefined "desired future condition" rather than allowing it to be the product of the public planning process and in accordance with the flexible and permissive nature of TLMP. This violates NFMA.

The DEIS (at 2-14) also goes so far as to claim that the no-action alternative "would not contribute to local employment or income and would not move the area toward the desired future condition." This statement is utterly false and further shows the agency's bent toward their own version of a desired future condition. Apparently, the only employment and labor worthy of consideration to the FS, is that associated with industrial-scale land disturbing activities. The agency ignores the current significant contribution the area makes toward local employment and income in commercial fisheries, guiding, tourism, and recreation. Likewise, any discussion of the cultural and economic ties of Kake residents who rely heavily on this part of Kuiu Island was omitted. Please remove the above erroneous statement from any future version of the Crane/Rowan environmental analysis.

## SUBSISTENCE

As you are aware, the sale area has been the subject of much controversy regarding subsistence uses, particularly deer, by local Kake residents. Although subsistence deer hunting did not occur on Kuiu for 17 years, this area has a documented history of heavy reliance on subsistence uses, including deer, for thousands of years - longer than the FS was even in existence. With the heavy cutting of lands near Kake, both private and Federal, Kuiu is even more important than in the past for subsistence deer use. Claims are made in the DEIS (at 3-60), that "[t]he area is not an extensively used subsistence harvest area." and "[t]he proposed action will not cause significant restriction [sic.] on subsistence wildlife" DEIS 3-61 must be supported by facts. No where is this accomplished - in violation of NEPA

In fact, the record cites claims to the contrary. For example, former Forest Supervisor Abigail Kimbell stated in the Record of Decision (at 32) for the North and East Kuiu Timber Sales, :

*"I believe there may, however, be a significant restriction of subsistence use of Sitka blacktailed deer in the Project Area due to estimated impacts on future abundance and distribution. This is regardless of which of the action alternatives is implemented"*

Furthermore, the North and East Kuiu FEIS (at 3-110) claimed:

*" there is a significant possibility of a significant restriction for abundance and distribution of deer, under all alternatives, including Alternative 1, the No Action Alternative. "*

We have examined Alternative 2 for the North and East Kuiu Timber Sale FEIS at 3-110. This particular alternative did not cut timber in the unroaded portion of East Kuiu, yet it claimed to result in a "significant possibility of a significant restriction for abundance and distribution of deer." Also noteworthy, is the fact that the N&E Kuiu no-action alternative coincides with the project area for the Crane /Rowan sale area and was claimed to result in deer subsistence restrictions.

Obviously, the record demonstrates significant subsistence use of deer in the project area as well as the possibility of a significant restriction - even in the absence of more logging in the project area. We must therefore, conclude that there is no basis for your claim. Please correct this major error in your future EIS and hold the required ANILCA subsistence hearings in affected communities. This will give your agency an excellent opportunity as well, to practice "collaborative stewardship" as the TLMP ROD (at 42) mandates.

## CUMULATIVE IMPACTS

The Forest Service has failed to disclose and evaluate, in this DEIS, the NEPA, Section 810 of ANILCA, and CEQ required cumulative direct and indirect impacts of current, past, and reasonably foreseeable timber sales on Kuiu Island, in one EIS. For instance, the cumulative impacts of the Saginaw, Rowan Settlement, and East Kuiu Timber sales, and logging on nearby private lands on subsistence resources on Kuiu Island were not disclosed or evaluated. These timber sales represent both cumulative and significant actions, which may result in a significant restriction on subsistence use of deer, and renders the Crane/Rowan ANILCA 810 finding in error.

Likewise, the analysis of impacts on deer in the project area (Table 3-3), where approximately 80% of the deer habitat capability will remain in the year 2030, is flawed due to the failure to consider, evaluate, and disclose cumulative impacts for all, past, current, and reasonably foreseeable future projects.

Please disclose the basis for the "assumption" (DEIS 3-10) that retention of 50% of the overstory will result in a retention of 50% of the old growth habitat capability. Your conclusions must be supported by accurate and verifiable information applicable to the stands in question.

## FOREST DEVELOPMENT ROAD SYSTEM

In this EIS as well as past EIS's, and despite construction of approximately 120 miles of road in the project area over the years, the Forest Service has failed to disclose and adequately analyze its plans for a permanent road system for Kuiu Island or Tongasswide for that matter, subject to the public planning process. This violates NFMA.

Additionally, the FS must comply with the relevant standards and guidelines in the revised TLMP, TRAN 212, I, B, which direct "the orderly development and management of the transportation system and ensure documentation of a decision affecting the system."

Both the Southeast Alaska Area Guide and the 1983 Alaska Regional Guide require transportation planning to be integrated with "present and future land management plans to the extent feasible" (Regional Guide at 3-35, Appendix B at 63.) The Regional Guide also states that forest plans "will show existing and anticipated forest arterial and major collector corridors", and that plans will "identify as far as possible, what modes of transportation will be developed in a given area" Id. Since the Forest Service has never evaluated the effects of the forest development road system plan on Kuiu (or the Tongass), it has fallen far short of the requirements of NFMA, NEPA, TLMP, and the Regional Guide.

The DEIS admits "there is little difference between alternatives in both the length of new road construction and the number of stream crossings." DEIS at 3-59. In fact, following construction of any of the action alternative 6.6 road miles, there will be approximately 120 miles of road in the project area. In order to comply with all applicable laws, including the need to provide for a full range of alternatives, we request that the next Crane/Rowan analysis include an alternative that builds no more roads in the project area.

The intense national debate regarding the construction of new logging roads on Forest Service lands, and your own Chief's recent public comments regarding the serious detrimental effects of road construction on public resources, should be incentive enough to offer an alternative absent of more road construction.

Given the inability of the Stikine Area to properly maintain their existing road system, we seriously doubt the agency's ability to maintain even more. For example, the DEIS (at 3-33) admits that "[f]ill from a road washed out when a **48-inch culvert** was plugged with organic debris or when runoff was too great for the culvert to handle. About 1000 yards of coarse textured road fill entered the stream at this site." (emphasis added). The FS must provide the public with a full description of problems with road maintenance on the Stikine Area.

Also, please provide credible information that funding will be available in the future to not only maintain roads that will not be closed, but to maintain roads that will be closed as described in the road cards, ie.: "remove or bypass all drainage structures ...add waterbars."

We would also like credible disclosure and evaluation of the relative effects on fish habitat and water quality due to road construction, as well as an explanation of the 2400-17 allowances for post-sale maintenance of these and other roads in the proposed sale area.

#### WATERSHED EFFECTS / FISHERIES IMPACTS

The DEIS failed to fully disclose and evaluate the impacts on fish habitat and water quality, nor did it conduct a watershed analysis in accordance with guidelines of "Ecosystem Analysis at the Watershed Scale : Federal Guide for Watershed Analysis"(August 1995)." Revised Forest Plan J-1. Accordingly, the DEIS must follow the six step process for conducting ecosystem analysis at the watershed scale, including:

1. characterization of the watershed,
2. identification of issues and key questions,
3. description of current conditions,
4. description of reference conditions,

5. synthesis and interpretation of information, and
6. recommendations.

The cursory Dean and Security Creek(s) watershed analysis' presented in this DEIS fail to disclose what standards were used in conducting the watershed analysis. Please include a watershed analysis in accordance with the above criteria in your future EIS.

We also request that the FS complete the required hard look at watershed hydrology required as a part of the watershed analysis - in particular the effect of timber harvest on evapotranspiration. The USDA, Alaska Region Watershed Analysis Handbook (at 25) describes decreased low flows resulting from a higher evapotranspiration rate created by the conversion of old-growth timber stands to vigorously growing second-growth vegetation. These effects are only visible after second-growth is well-established. Given the extensive clearcutting that has already taken place in the project area, consideration of the phenomena of evapotranspiration must be rigorously evaluated and disclosed. Decreased low flows resulting from clearcutting, as well as increases in water yields, can adversely affect fish habitat by changing water temperatures, oxygen levels, and eroding headwaters and channel banks.

The section on Fisheries in the DEIS (at 3 57-58) is wholly inadequate, particularly given the importance of Kuiu fish streams to the economy of Southeast commercial fisheries. The DEIS relegates evaluation of the impacts to the fish resources to the Appendix B unit cards buried in the back of the DEIS and further inappropriately claims that the new TLMP Standards and Guidelines are sufficient to protect habitat capability from timber cutting and land disturbing activities. This has not been demonstrated as evidenced by the blockage of the 48 in. culvert referenced above. Please provide monitoring data that supports your claim.

A readable map depicting Class I-IV streams in the project area in relation to the road system and all cutting units should be provided.

Finally, we request that the FS follow the Recommendations of the Alaska Department of Fish and Game (ADF&G) "reserve and restore strategy." This strategy proposes that "certain lands are best suited for producing fish and should be kept free of human-caused disturbances." We note that several streams in the project area qualify as ADF&G Primary Fish Producers, including Kadake Creek, and ADF&G # 109-52-10080 (VCU 402), as well as the DEIS's (at 3-58) own admission that although the study area includes only 26% of Kuiu Island it has the capability to produce 46% of the pink salmon and 56% of the coho salmon on Kuiu. The Forest Service should therefore follow ADF&G's recommendations and reserve and restore these watersheds in order to preserve the long-term health of southeast Alaska's salmon stocks.

## MARKET DEMAND FOR TIMBER

The FS continues to ignore the realities of the current timber industry in Southeast Alaska by failing to accept the closure of the KPC and Wrangell sawmills - as evidenced by the inflated estimates of market demand used in Appendix A of the DEIS (at A-2). This analysis improperly relies on "either installed mill capacity or actual historical consumption", and even goes so far as to incorrectly claim these methods provide the "best available estimates". The DEIS further states "demand for sawtimber and utility wood based on installed mill capacity of timber processors in FY 1997 was 495 mmbf with the Wrangell Mill" ! DEIS A-3. Unbelievably, the analysis turns a blind eye to the recent market demand study conducted by the FS's own economists, Brooks and Haynes.

According to the study by Brooks and Haynes, various market demand scenarios were estimated for the years in which timber will be offered for this sale, 1998-2003. Market demand was estimated to be between 96 mmbf and 130 mmbf and draft analysis of this report even included the "quite plausible" likelihood that demand may fall to 70 MMBF - a suggestion that was removed from the final analysis. Contrary to the DEIS (at A-3), the estimates **do not** in any case consider "changes in the the international wood products market, changes in the structure of the Alaska forest products industry, a continuing change in the Pacific Northwest and Canada.

The Brooks and Haynes report offers several good reasons why the "low scenario" of 96 mmbf (or lower) should be used to determine market demand including, in large part, the softening dependence of Alaskan wood product markets on Asia, the declining value of the Yen, greater acceptance of engineered wood products, and the higher costs of doing business in Alaska.

In fact, on all counts, markets have softened dramatically in recent months while the Yen continues to plummet. The DEIS paints a much rosier picture, far removed from reality, for timber demand. The failure of the DEIS to disclose and consider the results of the Brooks and Haynes Report violates NFMA. Further, the FS violates Section 101 of the TTRA by proposing to offer timber in excess of market demand consistent with the multiple use and sustained yield of all forest renewable resources.

As a consequence of the proposal to offer timber in excess of market demand, this timber sale will have significant cumulative effects on subsistence uses, in violation of Title VIII of ANILCA.

## ROUND LOG EXPORT AND MARKET DEMAND

The FS routinely and quietly permitted export of 104 mmbf of round logs off the Tongass in 1997, the majority of which were spruce and hemlock. This fact is not cited in the DEIS despite

significant effects on market demand estimates. We strongly object to the practice of round log export off the Tongass particularly in the atypical, quiet manner it has been accomplished. Furthermore, round log export off public lands is particularly disturbing since the successful bidder, Rayonier, doesn't even own a processing plant in Southeast Alaska. The Agency's commitment to make a transition to a new kind of timber industry in Southeast Alaska - one dependent on high value added wood products - is non-existent in light of this information. The exploitation of Tongass timber in the round amounts to nothing more than an embarrassing third world mentality. Why is the FS intent on artificially propping up the timber industry by employing tactics that fail to recognize a new era, and in fact take a giant leap backward? We urge you to cease this practice immediately, and to evaluate and disclose the effects of round log export on market demand for this timber sale.

Rayonier, the principal 1997 exporter of Kuiu timber, will likely be awarded timber offered as a result of this timber sale, since their equipment is already in place on the island. The Forest Service must disclose the amount of timber exported recently, in round log, off the island from the Saginaw Timber Sale by Rayonier, Inc.

#### ALEXANDER ARCHIPELAGO WOLF.

One of the key issues described in the DEIS Purpose and Need chapter (at 1-9) was a concern for wildlife including the wolf. Despite this fact, the DEIS provides no analysis of the impacts to the Alexander Archipelago Wolf, and defers a description of those effects to the Revised Forest Plan "by reference". DEIS 3-25. This is a serious abdication of your responsibility to the public to rigorously explore and evaluate the environmental effects of the proposed sale at the project level. In the absence of such documentation, the public cannot be fully satisfied that it is doing everything possible to insure viable and well-distributed populations of wolves.

In fact, a quick glance at the proposed average road density per square mile for all alternatives, including the no-action, shows a range of between 1.6 to 2.06. As you are aware, according to the Wolf Conservation Assessment (Revised TLMP Appendix N, 1997) road access has been determined to significantly contribute to wolf mortality. The Assessment found that wolf mortality rates increased significantly in WAAs where road density exceeded .49 miles/square mile. Person et al., a 1996, p.23. The Assessment further found that the maximum road density where wolves are generally found to survive is .9 miles of road/square mile. Person et al., 1996, p.24. Rather than take this evidence into account, and incorporate it into this analysis, as well as the Revised TLMP, your agency has chosen to proceed with business as usual and deal with the consequences later.

The ineffectiveness of road closure measures, also cited in the Assessment (at Person et al., 1996, p. 26), suggest the best way to enforce road closures is not to build them at all. This is another argument in favor of an alternative that builds no more roads in the project area, particularly since existing road density already greatly exceeds the threshold where serious impacts on wolves are known to exist.

Please include an analysis of the deer density/square mile in the project area, in terms of 1954 density, current density, 2060 density, and following all past, current, and reasonably foreseeable development activities, and taking into account increases in human demand for deer. This figure is of particular importance for analysis of the impacts to wolves for all action alternatives. For example, according to the Wolf Conservation Assessment a minimum density of 13 deer per square mile requires a habitat capability of 18 deer per square mile (Person, 1997. p.3.). Please provide a credible analysis that verifies enough actual deer to meet the needs of wolves and subsistence hunters.

#### NORTHERN GOSHAWKS

Although two northern goshawk sites nest sites were found in the project area, there is virtually no discussion of the possible impacts resulting from this proposed sale in the DEIS (3-24). The only protective measures that were identified included a 100-acre core area around one nest site and the existence of the other nest in an old growth reserve. There is no discussion of the adequacy of these described protections.

The DEIS (at Summary i) relies on direction in the Revised TLMP ROD that identifies the proposed Crane/Rowan Mountain Timber Sales as a Category 3 project and makes exceptions for new standards and guidelines for wildlife addressing landscape connectivity, endemic terrestrial mammals, northern goshawk, and marten management. The agency deferred discussion of any protective measures for this species to the Revised TLMP and an agreement with the FWS and ADF&G to conserve species of concern. While we support interagency coordination in implementing the revised TLMP, the FS lacks the discretion to exempt particular projects from specific standards and guidelines adopted in a new or revised forest plan, whether done in consultation with other agencies or not.

We request that the next analysis disclose what specific measures were adopted at the unit level, or if not, why not.

#### HIGHGRADING

Examination of table 3-23 raises concerns that this particular sale is a highgrade sale. Most of the cutting, particularly clearcutting, for all alternatives, is concentrated in the high

volume stands. NCC has been on record for years in support of the anti- highgrading provisions of the TTRA - whether practiced by long term contract holders, or independent operators on the Tongass. The FS has argued, in opposition, for years that independent timber sales are exempt from the letter and intent of the law regrading proportionality, and even went so far as to remove the entire section on proportionality from the Revised TLMP because they claim this provision is no longer applicable. This is incorrect.

The record of Congressional debate on reform of Tongass management reflected specific concern about the disproportionate level of clearcutting on the highest volume timber on the Tongass. For but one example, the Senate Energy Committee argued in 1990, prior to passage of the TTRA :

"The Tongass boasts a wide variety of wildlife species, including black bears, deer, moose, wolves, seals, sealions, ravens, bald eagles and a relatively large and thriving population of brown (also called grizzly) bears. Some of these species rely on high-volume old growth stands to provide appropriate browse and cover."

S. REP. NO. 010-261, 101st Cong., 2d Sess. at 8 (March. 30, 1990).

A brief glimpse of TTRA's legislative history, demonstrates **Congress intended this landmark legislation to reform all Tongass management.** Even if the Forest Service disagrees with this interpretation of the TTRA's statutory language, it would be extremely hard pressed to argue that the Revised Tongass Plan should, as a policy matter, allow the practice of highgrading on the Tongass. Regardless of the letter and intent of the law, high volume stands of old growth are rare on the Tongass and likewise extremely important for providing wildlife and ecological values.

In the interest of Collaborative Stewardship, the agency should, identify and map the location of high volume stands, Volume Class 6 and 7 old growth, in the project area, and demonstrate that the FS is applying the practice of proportionality to their proposed cutting practices. As Stikine Area personnel are aware, an analysis of proportionality is possible as demonstrated in the Crystal Creek Timber sale DEIS (at 3-8).

#### ERRATA COMMENTS

The alternative maps provided both in the EIS as well as the February 6, 1998 supplemental information are quite difficult to interpret. While we applaud the FS for including information pertinent to the sale, the difficulty of interpreting all the information presented, on one map, could be remedied with overlays

of the same scale, similar to the maps provided in the Mitkof Island Analysis. We also suggest a different color scheme, where existing/NEPA approved cutting units are depicted in solid red. Likewise, the existing and planned road system should be of a separate color, as well as existing or planned closed roads. Topo lines should be grey. The legend should replace the term "Existing/Planned" with "Existing/NEPA Approved"

Once again, thank you for the opportunity to comment on this timber sale.

Sincerely,

*Rebecca Knight*  
Rebecca Knight for NCC



File Code: 1950

Date: June 30, 1998

Rebecca Knight  
Narrows Conservation Coalition  
P.O. Box 1331  
Petersburg, AK 99833

Dear Ms. Knight:

Thank you for your comments on the Draft Environmental Impact Statement for the Crane and Rowan Mountain Timber Sales. In response to your letter, changes have been made, where appropriate, in the Final EIS. This letter and a copy of your letter dated March 26, 1998, will be printed in Appendix C of the FEIS. The following replies are in the approximate order as the comments in your letter.

#### *General comments*

An important consideration in the preparation of this EIS has been reduction in paperwork as specified in 40 CFR 1500.4. In general, we have tried to make this EIS as brief and concise as possible while providing enough site specific information to demonstrate a reasoned consideration of the environmental impacts. Much of the technical information to support findings presented in the EIS is available in the planning file for this project in the form of specialists' reports, biological evaluations, watershed analysis reports, etc. This in-depth and technical information is available upon request at the Petersburg Ranger District office.

This document is the result of several years of timber harvest analysis on North Kuiu Island, including the previous analysis undertaken in the North and East Kuiu EIS.

#### *Purpose and need*

The purpose and need for this project is to respond to the goals and objectives identified in the Forest Plan and to move the project area towards the desired future condition. The specific amount of timber volume to be harvested has not been predetermined. The analysis provides alternatives ranging from 0 to 24 million board feet. All of these alternatives are viable alternatives. The entire Crane and Rowan Mountain project area is allocated to the timber production land use designation. The Forest Plan goals listed on page 1-8 of the DEIS are those identified specifically for this land use designation. These goals are also listed on page 3-144 in the 1997 Forest Plan.

The volume estimates on the timber sale schedule for the Crane and Rowan Mountain area were based on harvest units from the North and East Kuiu EIS after the *AWRTA v. Morrison* settlement



agreement. Page 1-1 of the DEIS further explains this, and Chapter 2 of the DEIS explains the alternative development process.

Adaptive ecosystem management was incorporated into several of the alternatives. For example, various harvest techniques and cutting levels are proposed to harvest the units.

### *No-Action alternative*

The no-action alternative (Alternative 1) is considered in all the analysis throughout the EIS. The desired future condition of the Crane and Rowan Mountain project area is that stated in the 1997 Forest Plan on page 3-144 for the timber production management prescription. Discussion of the no-action alternative has been changed in the FEIS to reflect your comment.

### *Subsistence*

A more detailed description of subsistence use of deer is contained in the planning record as the subsistence specialist report. In response to your comments, we are including much of this information in the FEIS for this project.

The major reason there is a different ANILCA 810 subsistence finding between the Crane and Rowan Mountain EIS and the North and East Kuiu EIS is because different areas are analyzed. Deer subsistence analysis has been conducted on each Wildlife Analysis Area (WAA) within the project area. The North and East Kuiu EIS found that a restriction to subsistence use would occur in WAAs 5014 and 5018. However, the Crane and Rowan project area does not include either of these areas. (Please see North and East Kuiu EIS pages 3-105 through 3-108.) In the North and East Kuiu EIS, the analysis did show a restriction to subsistence for Alternative 2 which included harvest in WAA 5018. In this WAA, there is a significant restriction even with the no-action alternative because hunter demand exceeds habitat capability. Again, the Crane and Rowan Mountain project does not include WAA 5019.

The analysis in the Crane and Rowan Mountain Timber Sales EIS uses an updated model for predicting deer habitat capability (Version 7.0.1, TLMP 1997), and uses the standards and guidelines from the 1997 Forest Plan. This analysis shows less impact to deer habitat than the analysis conducted for the North and East Kuiu EIS due to the application of the 1997 Forest Plan standards and guidelines and alternative harvest practices.

We have been in contact with the Organized Village of Kake and we completed the three meetings required by the AWRTA settlement. We also met with the communities of Point Baker and Port Protection during a TLMP meeting to discuss our plans for continued management on Kuiu Island in compliance with the AWRTA agreement. We conducted an open house at Kake and Petersburg describing the Crane and Rowan Mountain project in detail. Details of these meetings are located in the planning record for this EIS.

We are continuing these "collaborative stewardship" mandates. We continue to meet with the Organized Village of Kake to discuss all activities on the Petersburg Ranger District to continue a government to government dialog.

### *Cumulative impacts*

The effects analysis in the DEIS includes the cumulative effects of all past timber harvest as well as the Rowan Settlement and the Saginaw Timber Sale which are currently under contract but not yet logged. It is too speculative at this time to include detailed analysis of possible timber harvest on East Kuiu as this is in the very preliminary stage of planning. An additional sale identified as the Kuiu Backline sale is on the 10-year sale schedule for the year 2005. This schedule is very tentative, however, and may change in the next seven years. Cumulative impacts to the island as a whole, however, will be considered as part of the planning process for any future timber sales on Kuiu Island.

The assumption that 50 percent retention of the overstory will result in a retention of 50 percent of the old growth habitat is based on monitoring results from two partially harvested stands in Thomas Bay. (USFS, 1995, available in the planning record.)

### *Forest development road system*

The Forest Service maintains a forest development transportation plan in accordance with direction found in Forest Service Manual 7711. The manual states that this plan "is the official description of the forest development transportation system and consists of a base map or series of base maps showing the location of each facility and an inventory record defining their characteristics. These documents shall also serve as the forest development road system plan referenced in the National Forest Management Act." The key point is that this plan is a description of existing permanent roads.

Direction is provided in Forest Service Manual 7711.2 for keeping this plan current. "Add proposed (nonexisting) facilities to the plan only after a decision to construct the facility is made by the responsible official in accordance with the National Environmental Policy Act process...". Only after the Record of Decision for this project is signed can permanent roads that are necessary to carry out the project be added to the forest development transportation plan.

This planning process ensures the orderly development of the transportation system, and updates direction for its management, as required in the 1997 Forest Plan. Decisions affecting the transportation system will be documented in the Record of Decision and in the line officer approved road management objectives.

All forest arterial and major collector roads are already in place in the study area. The North and East Kuiu EIS did analyze the full arterial and collector road system on Kuiu Island. The road system required to implement the desired future condition of the 1997 Forest Plan will be analyzed in subsequent analyses.

Alternative 1 would build no new roads in the project area. Please see Table 2-2 on page 2-26 of the DEIS.

Maintaining an increasing road system within the current maintenance budget is difficult. Since this is so, we will place many of the existing and all of the new roads into "storage". Please see page 6 of the road management objectives in Appendix B of the DEIS. Since natural drainage patterns are restored when a road is put into storage, future maintenance costs will be dramatically reduced.

Funds have already been secured to carry out the road storage work that was recommended in the Security Creek Watershed Analysis.

With regard to other maintenance problems, we are currently working cooperatively with the Alaska Department of Fish and Game to catalogue all road maintenance needs on the Stikine Area. We expect to have accomplished 80 percent of the basic road condition inventory by the end of this field season. The inventory is available for inspection at the Supervisor's Office or the Petersburg Ranger District. In general, the road maintenance needs are relatively minor in relation to the amount of road. Road maintenance is an ongoing and important part of forest management.

For an evaluation of the relative effects on fish habitat and water quality due to road construction, see pages 3-29 through 3-38 and 3-59 of the DEIS. In addition, more information is available in the Security Creek and Dean Creek Watershed Analyses, available in the planning record.

The actual post-haul maintenance allowance for these timber sales will not be calculated until the appraisal is prepared. This occurs after the Record of Decision is issued. Allowances for similar work on 5.0 miles of road in the King George Timber Sale were \$18,560, or approximately \$3,700 per mile.

#### *Watershed effects/fisheries impacts*

A watershed analysis report was completed for both Security Creek and Dean Creek watersheds since a higher percentage of their areas have been logged. These analyses are available in the planning record. No other watersheds within the project area are near the threshold of concern outlined in Appendix J of the 1997 Forest Plan.

The topic of increased evapotranspiration was incorporated into the watershed analysis report for Security and Dean Creeks. The effect on evapotranspiration when old-growth timber is converted to vigorously growing second-growth is not well understood in Southeast Alaska. To date, only one short-term study has been completed. This study indicates that low flow water yield may increase following clearcut harvest (Bartos, 1989). Cool temperatures, long duration rainfall, and decreased interception loss may all work to increase rather than decrease low flow response. The effect on evapotranspiration during large flows may be minimal, as these floods typically occur during periods when precipitation is of long duration and moderate intensity. During these times, both the canopy and soils become saturated regardless of the age of the forest cover. Based on the available information, we believe that the risks of adverse waterflows from increased evaporation and/or transpiration from the Crane and Rowan Mountain alternatives are minimal.

Some change to fish habitat may have occurred in the past as a result of plugged culverts and culvert wash-outs within the Crane and Rowan Mountain planning area. The new riparian standards and guidelines in the 1997 Forest Plan adequately protect fish habitat and will be applied equally to all alternatives. The Dean Creek and Security Creek Watershed Analyses and the Fisheries Specialist Report in the planning record provide more discussion, and are available upon request.

Maps depicting class 1 through 4 streams, the road system, and cutting units are provided in Appendix B of the DEIS.

The draft Recreational and Commercial Fishery Value Report is not the official position of the State of Alaska. The State of Alaska concurred with the Forest Service in the 1997 Forest Plan that all

anadromous streams would receive equal protection. These riparian standards and guidelines are applied to all streams within the project area.

### *Market demand for timber*

As in the rest of the world, timber demand in Southeast Alaska fluctuates dramatically on an annual basis. The level of demand is difficult for the Forest Service and the timber industries to predict with any precision. Demand is not a single number. It is influenced by complex interactions that include interest rates, housing starts, value of the dollar, changes in export policies, and business cycles. The Brooks and Haynes figures are based on global demand and minor changes in assumptions could mean large-scale differences in demand for Alaskan timber products.

The Forest Service is not offering timber in excess of demand. It takes approximately 3 years to progress through the NEPA process and sale preparation. In order to maintain a stable timber sales program, the Forest Service needs to provide a continuous flow of timber to the public. The Stikine Area has sold all recent timber sales that have been advertised, the bid rates have been above the minimum advertised rates, and most sales have had multiple bidders. These events indicate that the supply for National Forest timber has not exceeded demand.

### *Round log export and market demand*

The actual amount of timber exported from the Tongass National Forest in 1997 was 38 million board feet. By permitting some export of unprocessed logs, the Forest Service has successfully helped many timber purchasers remain in business. The Forest Service is acting to support key ideas of the Governor's Timber Task Force Report and helping to respond to the needs of an emerging value-added wood processing industry.

The Alaska Region of the Forest Service drafted new timber export procedures and solicited public comment on these procedures in April 1998. The proposed policy responds to Section 347 of the Department of Interior and Related Agencies Appropriations Act of 1998 (PL 105-83).

No wood has been exported from either the Saginaw or Rowan Settlement timber sales purchased by Rayonier Incorporated, since logging has not started on either sale. Rayonier is authorized to export wood under a settlement agreement reached after the *AWRTA v. Morrison* litigation.

The Crane and Rowan Mountain Timber Sales will be sold under the competitive bid process for independent timber sales. It is inappropriate to speculate on which companies may bid on the sales.

### *Alexander Archipelago wolf*

The complete environmental effects of the Crane and Rowan Mountain Timber Sales on the Alexander Archipelago wolf are located in the Biological Evaluation in the planning record.

Wolves are impacted by people using the roads, not the roads themselves. The road density thresholds developed from studies on Prince of Wales Island (Person et al, 1996, 1997) should only be applied to islands with similar road use patterns. Unlike Prince of Wales Island, Kuiu Island has no permanent communities and is not connected to the ferry system. Dave Person, in a memo entitled "Analysis of deer harvest and road data" and addressed to Moira Ingle, Doug Larsen and

Matt Kirchhoff of ADF&G states: "The data shown are only for WAAs on Prince of Wales Island. The dynamics and relations that may exist on the other islands in the region may be different from POW because they do not have the human population and access to a ferry system, which can transfer automobiles." An analysis of the deer density per square mile is available in the Subsistence Specialists Report and the Wildlife Specialist Report in the planning file.

### *Northern goshawks*

Forest Plan standards and guidelines were developed by an interagency team for the protection of the Northern Goshawk. These guidelines have been fully applied to the Crane and Rowan Mountain area. There are two goshawk nests known to exist in the project area. A 100 acre buffer has been placed around the nest near Rowan Creek, which was inactive during the 1998 nesting season. The other nest, located near Fall Dog Creek, was active in 1998 and is in an Old Growth Land Use Designation that will not be harvested. If other goshawk nests are found in the project area, the buffer requirements in the Forest Plan standards and guidelines will be implemented.

The Record of Decision (ROD for the Forest Plan directs the Forest Service to meet with other State and Federal agencies to bring on-going activities (projects started prior to the signing of the Forest Plan) into compliance with the new Forest Plan.

Crane and Rowan Mountain was a category 3 timber sale listed in the ROD. We met with the other interested State and Federal agencies to ensure that all Forest Plan standards and guidelines were met (the meeting notes are in the planning record of this EIS). All agreed that this planning effort met the standards and guidelines fully and that no other mitigation measures were needed to meet the requirements of the Forest Plan.

### *Highgrading*

The Crane and Rowan Mountain Timber Sales are planned for independent sales and so proportionality does not apply. A map has been included in the FEIS showing volume strata and proposed harvest units.

### *Errata comments*

We have revised the alternative maps in the FEIS to make them simpler and hopefully easier to interpret. We have also added additional maps to reduce the amount of information on one map.

Sincerely,



CAROL J. JORGENSEN  
Assistant Forest Supervisor

*P.S. Thank you again for the time and review of this document.*



# Southeast Alaska Conservation Council

SEACC 419 6th Street, Suite 328, Juneau. AK 99801  
(907) 586-6942 phone (907) 463-3312 fax  
info@seacc.org

Received

APR 2 1998

March 30, 1998

**Tongass N.F.**

Everett Kissinger, Team Leader  
USDA Forest Service  
PO Box 1328  
Petersburg, AK 99833

re: comments on Crane and Rowan Mountain Timber Sales DEIS

Dear Mr. Kissinger:

Thank you for providing the opportunity to comment on the Crane-Rowan Mountain Timber Sales Draft Environmental Impact Statement (DEIS). The following comments are submitted by the Southeast Alaska Conservation Council, a coalition of 15 volunteer citizen organizations located in 12 communities throughout Southeast Alaska, from Yakutat to Ketchikan. SEACC's members include commercial and sport fishermen, Alaska Natives, small-scale independent timber operators and value-added wood manufacturers, sport hunters and professional guides, subsistence users, tourism and recreation business owners and Alaskans from many other walks of life.

SEACC is dedicated to preserving the integrity of Southeast Alaska's unsurpassed natural environment while providing for the balanced, sustainable, use of our region's resources. Southeast Alaska contains magnificent old-growth forests, outstanding fish and wildlife habitat, vital customary and traditional use or subsistence areas, excellent air quality and a landscape that allows Alaskans to live a lifestyle no longer available to most Americans.

While we appreciate the increased emphasis on selection logging methods in this timber sale, we are alarmed that the Forest Service has misused TLMP, and violated NEPA, TTRA, NFMA, and ANILCA in preparing this draft EIS. We are also disappointed to see that this DEIS fails to adequately address the concerns of the Organized Village of Kake or meet the requirements of the AWRTA settlement.



## I. THE PURPOSE AND NEED STATEMENT IN THE DEIS MISCONSTRUES THE BROAD AND PERMISSIVE NATURE OF THE REVISED TLMP.

### **A. Manipulating the Broad Goals and Objectives in TLMP to Achieve a Preconceived Outcome Violates NFMA.**

According to the DEIS, the purpose and need for the Crane and Rowan Mountain DEIS is, "... to respond to the goals and objectives identified by the Forest Plan and to move the project area towards the desired future condition." DEIS 1-8. The Forest Service characterization of the "desired future conditions" for this project area, however, is inconsistent with the broad, permissive direction of the Revised TLMP. The Forest Service identified 18 "Forest-wide multiple use goals and objectives" in the Revised TLMP. According to TLMP, at 2-2, these "... goals are expressed in broad, general terms and specify no date by which they are to be accomplished."

Contrary to the broad direction of TLMP, the DEIS' Purpose and Need statement cites only TLMP goals and objectives that justify logging 24 mmbf from the project area. The goals listed under the Timber Production LUD are cited in the DEIS, namely:

"To maintain and promote industrial wood production from suitable timber lands, providing a continuous supply of wood to meet society's needs

To manage these lands for sustained long-term timber yields.

To seek to provide a supply of timber from the Tongass National Forest which meets the annual and planning-cycle market demand, consistent with the standards and guidelines of this Land Use Designation."

DEIS 1-8. The DEIS fails, however, to cite any of the objectives of this LUD, which include "identify opportunities for diversifying the wood products industry (such as special forest products, and value-added local production)" Revised Forest Plan 3-144. Instead of defining the purpose and need for this project broadly to accomplish the forest-wide multiple-use goals and objectives of the plan for this area, the agency improperly focused on those goals and objectives consistent with its specific proposed action -- logging 24 million board feet (mmbf) of timber and constructing 8 miles of road. Although timber objectives are a primary consideration in the Timber Production LUD, NEPA and the adaptive management principles embraced by the new TLMP requires consideration of all objectives.

The planners properly did not attempt to restrict the range of alternatives by identifying a specific timber target as this project's "purpose and need." However, defining the "purpose and need" by preferring only those forest multiple-use goals and objectives consistent with the agency's "proposed action," prevented the Forest Service from "... rigorously explor[ing] and objectively evaluat[ing] all reasonable alternatives," particularly the no-action alternative. See 40 C.F.R. 1502.14. Defining the proposed action, which is also the preferred alternative, as consistent with the "desired future condition" for this project area ignores the permissive nature of the Revised

TLMP, and is also inconsistent with the fundamental principles of adaptive ecosystem management and collaborative stewardship that form the bedrock for the Revised TLMP. This violates NFMA.

### **B. The Forest Service Violates NEPA By Using the “Desired Future Condition” to Restrict the Range of Alternatives.**

Consideration of alternatives is the “the heart of the environmental impact statement.” Alaska Wilderness Recreation and Tourism Association v. Morrison, 67 F.3d 723, 729 (9th Cir. 1995) (“AWRTA”) These alternatives must include no-action: “informed and meaningful consideration of alternatives - including the no-action alternative - is thus an integral part of the statutory theme.” Bob Marshall Alliance v. Hodel, 852 F. 2d 1223, 1228 (9th Cir. 1988) cert. denied, 489 U.S. 1066 (1989) (emphasis added).

The Forest Service never actually compares the benefits of selecting the "no action" alternative. Instead, the Forest Service relies on "the desired future condition that is stated in the Forest Plan" -to justify a lack of meaningful consideration of the no-action alternative. Certainly, neither Section 101 of the TTRA nor the Revised TLMP compel selection of an "action" alternative. See AWRTA, 67 F.3d at 730-31 (TTRA gives the Forest Service flexibility among multiple uses); City of Tenakee Springs v. Block, 778 F.2d 1402, 1406 (9th Cir. 1985)(Tongass Plan permissive only); Revised TLMP, App. L at L-150 (“The Forest Plan does not make site-specific decisions...”). Moreover, if the Revised TLMP is truly permissive and did not make site-specific decisions, then the desired future condition proposed in the TLMP is not an inflexible standard or preordained result used to define the proposed action at the project-level, but the product of that public planning process.

By implying in the purpose and need section that logging in the Crane and Rowan Mountain Project Area is necessary to reach “desired future conditions,” the Forest Service is not allowing for meaningful consideration of the no action alternative, therefore artificially restricting the range of alternatives. This violates NEPA, which says: “Agencies shall not commit resources prejudicing selection of alternatives before making a final decision.” 40 C.F.R. § 1502.2(f).

### **C. The Forest Service Must Eliminate the 24 mmbf Timber Target.**

Table 2 of Appendix A to the Control Lake SDEIS reveals that the Forest Service has already scheduled 23 mmbf of timber from the Crane and Rowan Mountain project area for FY 98. According the Forest Service’s own published schedule, the agency plans to sell 23 mmbf of timber - nearly the same amount called for under the preferred alternative.

This table is enough to make a member of the public wonder if any alternative, other then the Forest Service’s preferred alternative, is receiving meaningful consideration. Despite dropping a volume-specific Purpose and Need for the project, the Forest Service is continuing to violate NEPA by pre-establishing the outcome of the Crane and Rowan Mountain Project planning process. See 40 C.F.R. § 1502.2(g).

## II. THE DEIS FAILS TO FULLY DISCLOSE AND EVALUATE IMPACTS ON SUBSISTENCE USE OF DEER, VIOLATING NEPA AND ANILCA.

### **A. The DEIS's Claim Regarding the Extent of Subsistence Use Is Not Supported by Fact.**

The Forest Service claims that "[t]he area is not an extensively used subsistence harvest area." DEIS 3-60. This statement is not only untrue, but contradicts well-documented information. The North and East Kuiu FEIS correctly stated:

"Traditionally, the Kupreanof and Kuiu Islands area has been an important deer harvest area..."

"Historically, important use areas for many of the communities hunting for deer include Security, Saginaw, and Kadake Bays; Rowan Bay, Bay of Pillars, and the mouth of Port Camden to the southern coast of Port Beauclerc."

North and East Kuiu FEIS 3-92. These statements are further supported by the "Ever Hunted Deer Areas - Kake" map found in Appendix B of the FEIS. This map shows subsistence deer hunting occurring along almost the entire coast of North Kuiu Island. Id Appendix B-1. The Revised TLMP also correctly states in its socioeconomic analysis for Kake that: "[f]or subsistence use, west Kupreanof and north Kuiu Islands are some of the most important areas." Revised TLMP FEIS 3-585. Finally, the importance of North Kuiu for subsistence is also confirmed by the Alaska Department of Fish and Game. See A. Firman & R. Bosworth, Harvest and Use of Fish and Wildlife by Residents of Kake, Alaska, ADF&G Div. Of Subsistence Technical Paper No. 145 (Feb. 1990). While subsistence hunting did not occur in the project area from 1975 to 1992, due to low deer numbers, North Kuiu Island has been historically important to Kake Tlingit for customary and traditional hunting and gathering for thousands of years. This statement in the DEIS is without basis in fact, and is therefore arbitrary and capricious. It also represents a violation of NEPA, since the Forest Service has a duty to insure that information and analysis presented in the DEIS is accurate and of high quality. See 40 C.F.R. § 1500.1(b)

### **B. The DEIS's Analysis of Impacts on Subsistence is Not Supported By Fact.**

The DEIS further states : "[t]he proposed action will not cause significant restriction [sic.] on subsistence wildlife..." DEIS 3-61. However, in the Record of Decision for the North and East Kuiu Timber Sales, former Stikine Area Forest Supervisor Abigail Kimbell stated :

"I believe there may, however, be a significant restriction of subsistence use of Sitka blacktailed deer in the Project Area due to estimated impacts on future abundance and distribution. This is regardless of which of the action alternatives is implemented."

North and East Kuiu ROD 32 (emphasis added). According to the North and East Kuiu FEIS, the Forest Service determined that there was "as significant possibility of a significant restriction for abundance and distribution of deer," under all alternatives, including Alternative 1, the No

Action Alternative. North and East Kuiu FEIS 3-110. Thus, even without additional logging on North and East Kuiu Island, subsistence use of deer will likely be restricted on North and East Kuiu, an area which includes the project area. The DEIS claims that the unroaded east Kuiu portion was the basis of a subsistence finding of a significant possibility of a significant restriction. DEIS 1-1. This claim is not-supported by facts, because even Alternative 2 for the North and East Kuiu Timber Sale, which did not log in the unroaded portion of East Kuiu, would have resulted in a "significant possibility of a significant restriction for abundance and distribution of deer." North and East Kuiu FEIS 3-110.

Section 810(a) of ANILCA requires the Forest Service to evaluate "other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes." See 16 USC 3120. Besides failing to fully disclose and evaluate potential impacts on subsistence use of deer, the Forest Service failed to meet this important requirement of ANILCA, because it failed to fully evaluate an action alternative which minimized impacts on subsistence users. Thus, the DEIS violates ANILCA.

Obviously, the Forest Service's analysis of impacts on subsistence, required by both NEPA and section 810 of ANILCA, is deficient. The Forest Service should have found that there was a significant possibility of a significant restriction of subsistence resources, due to the cumulative impacts on deer of past, present, and reasonably foreseeable timber sales on North and East Kuiu Island.

This deficiency shows up again in the DEIS's analysis on effects on deer in the "Habitat Conservation" chapter. For all alternatives, the Forest Service estimates deer habitat capability in the project area remaining in 2030 by considering only logging proposed under this timber sale. For example, the DEIS state that the preferred alternative "will have 80 percent of the habitat remaining at year 2030." DEIS 3-13. By failing to consider past, present, and reasonably foreseeable timber sales on North Kuiu Island, this analysis fails to give an accurate picture of likely deer habitat capabilities in the year 2030.

### **C. The Forest Service's Failure to Hold an 810 Hearing in Kake Violates ANILCA.**

Because there may be the significant possibility of a significant restriction of subsistence use of deer, the Forest Service is required to hold a subsistence hearing in Kake, pursuant to ANILCA. Given the importance of the project area, and all of Kuiu Island, to Kake residents, the Forest Service should have held a hearing on this timber sale in Kake regardless of section 810 of ANILCA. According to the TLMP ROD :

"Forest Supervisors and District Rangers will increase their efforts in collaborative stewardship within the communities of Southeast Alaska. Collaborative stewardship means bringing people together to share in the decision making in implementing Forest Plan direction."

TLMP ROD 42. The Forest Service's failure to hold a hearing in Kake on this timber sale flies in the face of this new direction and therefore violates NFMA.

### III. THE DEIS FAILS TO FOLLOW THE AGREEMENT REACHED IN THE AWRTA SETTLEMENT.

According to the Agreement in Principle Between the AWRTA Plaintiffs and the United States, it was mutually agreed that :

"With working cooperation by the Organized Village of Kake and other users of Kuiu Island, the Forest Service will, as part of the TLMP revision process, hold three one-day workshops in Kake to facilitate dialogue among users of Kuiu Island regarding future land and resource management on Kuiu Island... The Forest Service will expand the community meeting for TLMP in Point Baker to facilitate similar dialogue. The Forest Service will produce a report based on the workshops and meeting and include it in the public record for the TLMP revision."

*Agreement in Principle Between the AWRTA Plaintiffs and the United States* Para. 5c.

Unfortunately, no mention of these workshops appears anywhere in the DEIS. Since this timber sale is directly tied to the AWRTA settlement and is of keen interest to the Organized Village of Kake and other Kuiu Island users, the Forest Service must include in this DEIS a summary of this report as well as an explanation of how the project alternatives respond to the issues raised in that process.<sup>1</sup>

The Agreement in Principle also states :

"Any SEIS or EIS including any of the units, roads, or LTFs included in the enjoined portions of the Saginaw, Rowan I, Rowan II and East Kuiu sales and offerings will attempt to address access management issues of concern to OVK, including consideration of closure of roads providing access to the Kadake Bay drainage (VCU 421)."

*Agreement in Principle Between the AWRTA Plaintiffs and the United States* Para. 5d. Again, the Forest Service completely fails to address this important issue. The Forest Service must fully evaluate how OVK's concerns over access management were addressed in this DEIS. Failure to do so breaches the AWRTA settlement.

### IV. THE FOREST SERVICE VIOLATED NEPA BY RESTRICTING THE SCOPE OF THIS DEIS TO EXCLUDE CONSIDERATION OF OTHER PENDING PROPOSALS WHICH MAY HAVE SIGNIFICANT CUMULATIVE IMPACTS ON KUIU ISLAND, ITS RESOURCES, AND THE PEOPLE WHO DEPEND ON THOSE RESOURCES.

Before preparing an EIS for a particular project, the Forest Service is required to undertake a "scoping process" to identify what "issues" and "actions" will be analyzed and subject to a particular EIS. See 40 C.F.R. §§ 1501.7(a)(2), 1502.4(a). The CEQ

<sup>1</sup> The Forest Service should also include a full copy of this report in the DEIS.

regulations further require that “[c]umulative actions, which when viewed with other proposed actions have cumulatively significant impacts” must be considered together in a single EIS. Id. § 1508.25(a)(2). The CEQ regulations further caution that “[a] proposal may exist in fact as well as by agency declaration that one exists.” Id. § 1508.23

The DEIS fails to consider cumulative actions which have cumulatively significant impacts on the environment (especially subsistence use of deer) of the surrounding area, including the Saginaw, Rowan Settlement, and East Kuiu Timber Sales. The DEIS also fails to consider the cumulative impacts of other actions, including substantial logging on private lands around Kake, the most community most affected by this sale. In addition, the DEIS must disclose and evaluate the potential effects of S.1159, the Gunnuck Creek Land Exchange, which proposes to exchange Forest Service lands within the project area to Kake Tribal Corporation. See letter from Bart Koehler to Gordon Jackson (Oct. 23, 1997)(attached) see also letter from Tom Findley to Bart Koehler (Oct. 30, 1997)(attached). The DEIS must also disclose and evaluate the potential effects due to past and possible future selection of project area lands by Sealaska. See USFS map, "Selected but not Conveyed, ~1996." see also memo from Steve Brockman to Nevin Holmberg (Jan. 9, 1998)(attached). see also memo from Steve Brockman to Nevin Holmberg (Feb.2, 1998)(attached).

Each of these “cumulative actions” have been actually proposed and could have cumulatively significant impacts on the fish, wildlife, subsistence uses and recreational settings of Kuiu Island. The CEQ regulations require the Forest Service to evaluate the direct, indirect, and cumulative impacts from all of these proposed projects in one comprehensive EIS. 40 C.F.R. § 1508.25(a)(2).

Additionally, each of the above Forest Service timber sales represent “connected actions,” since they each contribute to the development of a permanent road network for Kuiu Island. CEQ regulations require “connected actions” to be considered together in a single EIS. See 40 C.F.R. § 1508.25(a)(1).

**The Forest Service’s decision to restrict the scope of the Crane-Rowan Mountain DEIS to this single project prevents it from educating itself and others about the larger context in which decisions affecting the environment of the surrounding area are made, thereby reducing the quality of the decisions made and rendering the EIS inadequate. See 40 C.F.R. §§ 1500.2( c), 1501.2, 1502.2, and 1502.5.**

The Revised Tongass Plan substantially hampers the public’s right to know, understand and participate in decisions affecting their public lands by dropping the requirement for a mid-level planning stage. As this project planning process demonstrates, the “two-step” planning process adopted for the Tongass in the 1997 revised TLMP is unworkable. It cripples the Forest Service’s ability to conduct a credible cumulative impact analysis. Without conducting public planning at some intermediate geographic scale, such as Kuiu Island, the public’s ability to understand and meaningfully participate in planning for the

sustainable use of lands and resources important to the long-term stability of their communities is impaired.

Rather than using the NEPA process for the Crane and Rowan Mountain project to collect and analyze important resource inventories for Kuiu Island, the Forest Service stayed focused on just a single piece of this ecological puzzle. The Forest Service thereby violated NEPA by failing to "initiate and utilize ecological information in the planning and development of resource-oriented projects." See 42 U.S.C. § 4332(2)(H). In order to fulfill its responsibility as "trustee of the environment for succeeding generations," 42 U.S.C. § 4331(b)(1), the Forest Service was obliged to collect and analyze comprehensive and accurate resource inventories for Kuiu Island, which is almost entirely under Forest Service jurisdiction. This was not done, and instead. Instead, the Forest Service continues to use outdated and unreliable data, such as the Timber resource inventory. This violates NFMA. See 36 CFR 219.12(d).

#### V. ALL ACTION ALTERNATIVES VIOLATE THE TTRA BECAUSE THEY OFFER TIMBER IN EXCESS OF LIKELY MARKET DEMAND.

As stated in TLMP :

"[t]he Alaska Region continues to use the projections of the Pacific Northwest Research Station (PNW Station) of the Forest Service as the most reliable and defensible estimates (Brooks and Haynes, draft 1997 update)."

Revised TLMP FEIS 3-262 as amended by TLMP Revision FEIS Errata (May 1997). In its discussion of market demand found in Appendix A, however, the DEIS states , "[d]emand can be estimated by looking at either installed mill capacity or actual historical consumption." DEIS A-2. The DEIS then goes on to cite Appendix M of the Forest Plan FEIS to state "demand for sawtimber and utility wood based on installed mill capacity of timber processors in FY 1997 was 495 mmbf with the Wrangell Mill" DEIS A-3. This statement is not supported by fact, and ignores the best available information. By failing to fully disclose the content of the Brooks and Haynes study, the DEIS violates NEPA.

#### **A. The Brooks and Haynes Report projected total demand for National Forest timber.**

For the low, medium and high scenarios, the Brooks and Haynes report calculated total market demand: "[t]hese figures refer to total National Forest Harvest, including both net sawlog and utility volume." Brooks and Haynes at 3 (emphasis added). For the period from 1998-2002, when all of the timber from the Crane-Rowan Mountain project is scheduled to offered for sale, the economists estimated market demand for Tongass timber to be 96 mmbf under the low scenario, 113 mmbf under the medium scenario, and 130 mmbf under the high scenario. Id. at 6.

## **B. The DEIS Proposes Logging in Excess of Market Demand, in Violation of TTRA.**

Section 101 of the Tongass Timber Reform Act states:

Subject to appropriations, NFMA, other applicable law, and the requirements of the National Forest Management Act ... the Secretary shall, to the extent consistent with providing for the multiple use and sustained yield of all renewable forest resources, seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest, and (2) meets the market demand from such forest for each planning cycle.

16 U.S.C. 539d(a). The Ninth Circuit has explained this provision as follows: "TTRA envisions not an inflexible harvest level, but a balancing of the market, law, and other uses, including preservation." AWRTA, 67 F.3d 723, 731 (9th Cir. 1995). As stated above, expected annual market demand for the years 1998-2002 ranges from 96 mmbf to 130 mmbf. During this same time period, precisely when the Forest Service plans to offer timber from the Crane and Rowan Mountain project, however, the Forest Service plans to offer an average of 225 mmbf per year, about double the median expected demand for Tongass Timber. See DEIS at A-12. As part of the total Tongass timber sale program, the Crane and Rowan Mountain Project contributes timber in excess of market demand. At the same time, the timber sale will have significant cumulative effects on subsistence uses, in violation of Title VIII of ANILCA. Therefore, since the proposed sale provides timber far in excess of market demand at the expense of maintaining healthy populations of deer from the project area for subsistence and sport uses, the Forest Service is violating TTRA.

## **C. In the Near-term, the Forest Service Should Consider Brooks and Haynes' Low Scenario As the Most Likely Estimate of Market Demand for Tongass Timber.**

In all drafts of their analysis, Brooks and Haynes chose not to describe any of these alternate scenarios as most likely, however, the authors did include the statement: "a scenario in which the derived demand for Tongass timber falls to 70 million board feet is quite plausible." Brooks and Haynes at 12 (May 26, 1997 draft). While this statement is conspicuously absent from the final document, several references in the final document support the same general idea.

Due to past market trends, expectation of continued high logging and manufacturing costs, and weaknesses in Japanese markets, the authors suggest that the low scenario is the most likely to occur.

The 'low' scenario is predicated on the assumption that markets for Alaska wood will improve: "[I]n the low scenario, Alaska was assumed to recover some of the markets lost to other producers; the recent trends in production and market share for Alaska are

reversed but only to a limited extent.” Brooks and Haynes at ii. Given past trends, however, assuming any gains in market share for Alaska wood is optimistic: “Alaska’s lumber production and market shares nevertheless have decreased steadily for more than 20 years, suggesting that the disadvantages may outweigh any advantage resulting from the value of Alaska’s raw material.” *Id.* at 7. “[A]ny gain [in market share] will be a reversal of trends observed over the past 20 years.” *Id.*

In forming the ‘low’ scenario, Brooks and Haynes assumed that higher costs limit Alaska’s share of markets. The authors give no indication that these higher costs will disappear in the future:

“Historically, harvesting and manufacturing costs in Alaska were 30 to 50 percent higher than those in the Pacific Northwest. In addition to increases in harvesting costs resulting from changes in management practices, competition for timber and the elimination of long-term timber sales have increased wood costs for Alaska mills.”

Brooks and Haynes at 9.

Thus, it seems likely that logging and manufacturing costs will continue to increase in Southeast Alaska, because higher cost disadvantages will not disappear. *See* O’Toole, Review of Tongass Forest Plan Assumptions about Timber Receipts and Costs, (Oak Grove, OR)(The Thoreau Institute, Nov. 14, 1997)(attached).

Finally, recent changes in Japanese markets make the ‘low’ scenario even more likely. The Japanese economy has lately been in a prolonged recession. Japanese housing starts have spiraled down from last year’s levels :

"[h]ousing starts in January were down 16.3 percent from the same month in 1996 - the 13th consecutive monthly down -- both for wood-based and non-wood-based starts...North American lumber imports in December were down 50.3 percent from the same month in 1996...Total imports for 1997 were 17.8 percent lower than the previous year, and total consumption also declined"

Hoshi, "Japan Market Report," *Pacific Rim Wood Market Report* (Mar. 1998)(attached). *see also* "Japan: Change Ahead," *Pacific Rim Wood Market Report* at 1 (Oct. 1997)(attached).

Brooks and Haynes state the importance of Japanese markets for the Alaska timber industry : "[t]his sensitivity analysis shows model results to be most sensitive to relatively small changes in Alaska’s share of North American shipment of softwood lumber to Japan.” Brooks and Haynes iii. Furthermore, when discussing the state of Japanese markets, the authors admit that “[f]actors that may make our medium projection too optimistic include further weakening of the Japanese market for hemlock and even greater acceptance of engineered wood products.” *Id.* 15.

Finally, there is no end in sight for Japan's economic woes. See "The Yen: Down She Goes (Again)," *The Economist* (Nov 15, 1997)(attached). Japan's demand for Alaskan wood products will likely remain reduced in the future. Therefore, there is additional reason to consider the 'low' scenario as the most likely scenario, at least in the near term. While some argue that market conditions will improve in 2-3 years, such statements are mere speculation and ignore market trends over the last 20 years.

The DEIS, however, fails to account for these major market changes and cites "recent higher than advertised bids" and "scarcity of wood" due to the Spotted Owl issue to claim that the current timber market is "higher than what has been experienced on the average." DEIS 3-40. The DEIS fails to back up these claims, however. According to Jack Phelps, executive director of the Alaska Forest Association, "[t]he marketplace for Alaskan woods, particularly hemlock and spruce, right now is pretty bad." See Rogoway, Mike, "Hobart Bay: An Uncertain Future," (Mar.24, 1998)(attached). By ignoring the current Asian market conditions, the DEIS fails to provide accurate and up-to-date information, in violation of NEPA. See 40 C.F.R. § 1500.1(b).

#### **D. The DEIS Fails to Disclose and Evaluate How Recent Round Log Exports Affect Market Demand Estimates.**

In 1997, the Forest Service authorized the export 104 mmbf feet of Tongass timber. This included a large amount of spruce and hemlock in addition to the usual red and yellow cedar export. See SEACC chart derived from F.S. export permit data (attached). See also "Stump Talk," *Pacific Rim Wood Market Report* (Feb. 1998)(attached). The Forest Service must disclose how much round log export occurred on the Tongass during 1997 and evaluate the effects on market demand estimates.

The Forest Service should also disclose the amount of timber exported in round log from the Saginaw Timber Sale by Rayonier, Inc. According to Forest Service data, Rayonier was authorized to export 8.4 mmbf of hemlock and spruce sawlogs with diameters 22" or less on small end, 3 mmbf of utility spruce and hemlock, and .5 mmbf of yellow cedar sawlogs under export permits 97-70, 97-71, and 97-72. Since Rayonier purchased both the Saginaw and Rowan Settlement Timber Sales, it is the most likely buyer of the Crane and Rowan Mountain Timber Sales. Given Rayonier's recent history and the fact that Rayonier does not have any processing facilities in Southeast Alaska, the Forest Service should disclose the likelihood of round log export from this sale.

#### **VI. THE USE OF THE NOWACKI, KRAMER STUDY IN THIS DEIS IS INAPPROPRIATE.**

Again, we are pleased to see the Forest Service consider alternatives which use selection logging methods as the primary logging method. But we are concerned by the use of a single "draft" study to excuse impacts from past, and proposed clearcutting and roadbuilding on North Kuiu Island. Using a study which has not yet been published and peer reviewed to justify the proposed timber sale is inappropriate.

The DEIS claims that "we will mimic the complete stand-replacing event by creating units with few trees left, moving them to the stand-initiation stage." DEIS 2-8 (emphasis added). However, the DEIS fails to provide any information to support its claim that large-scale clearcutting mimics natural disturbance patterns on Kuiu Island. If the DEIS proposes to mimic natural disturbance through logging, it must disclose and evaluate the different effects of blowdown, which leaves a legacy of woody material and stand structure; and clearcutting, which leaves little woody material and stand structure. The DEIS must also disclose what monitoring will be done to compare the effects of the logging proposed in this sale with the effects of natural disturbance.

## VII. THE DEIS FAILS TO FULLY DISCLOSE AND EVALUATE IMPACTS ON ALEXANDER ARCHIPELAGO WOLVES AND QUEEN CHARLOTTE GOSHAWKS.

The US Fish and Wildlife Service was petitioned to list the wolf in 1993 and the goshawk in 1994 under the Endangered Species Act of 1973. In 1995, the FWS found that listing was not warranted for either species. Both conclusions were challenged in court, and the findings were remanded to the Secretary of the Interior for reconsideration. In August 1997, following release and review of the TLMP, the FWS again found that listing these species was not warranted, based largely on full implementation of TLMP. This DEIS fails to demonstrate full implementation of TLMP or adequately disclose and evaluate potential impacts on wolves and goshawks as a result of this sale.

### **A. The DEIS Fails to Disclose and Evaluate Impacts on the Alexander Archipelago Wolf.**

Even though substantial controversy exists over the effects of Forest Service management on wolf populations, the DEIS contains absolutely no analysis of potential impacts on the wolf due to logging and roadbuilding resulting from the proposed sale. The only mention of the wolf comes in the form of a reference to the Forest Plan and a referral to the Biological Evaluation in the Planning Record. DEIS 3-25 This is wholly inadequate. The Forest Service must disclose this information to the public and decisionmakers in this DEIS about the project's potential effects on wolves.

The DEIS must disclose present deer densities and evaluate the potential effects on such densities due to this timber sale. SEACC has strong concerns that the deer density standard in TLMP does not fully implement the recommendations of the Alexander Archipelago Wolf Conservation Assessment. In TLMP, the Forest Service confused deer density per square mile with deer carrying capacity per square mile and adopted a standard requiring a deer carrying capacity of 13 deer per square mile. This is an incorrect application of the scientific recommendation outlined in the Wolf Conservation Assessment (1997). This error is pointed out by one of the Assessment's chief authors:

"A minimum density of 13 deer/square mile will require a carrying capacity of about 18deer/square mile. The Forest Service confuses this point in their discussion in the EIS.

Then, they compound the error by referencing a third number (5deer/sqaure mile) from a different, unpublished paper and suggest these values (5,13 and 18 deer/square mile) represent a range a suitable deer targets. This is incorrect. Eighteen deer per square mile is what they should manage for."

Letter from Kirchhoff to Waldo, Earthjustice at 1 (Nov. 18, 1997)(attached).

In the Conservation Assessment, the authors recommend maintaining a *minimum* average density of deer equal to 5 deer *per square kilometer*; this equals 13 deer/square mile.

Dave Person, another of the Wolf Conservation Assessment authors, has stated:

"The recommendation of maintaining an average deer density of 5deer/square mile would result in at least a 75percent reduction of wolves from the current population level. An appropriate density is about 15-18 deer/square mile if the objective is to assure a reasonably high probability of maintaining the current density of wolves."

See Letter from Person to Streuli, Acting District Ranger, Thorne Bay Ranger District at 5 (June 7, 1996)(attached)(emphasis added).

According to the revised TLMP :

"[t]he Wolf Assessment identified open road access as a contributing factor to excessive mortality, stating that reported wolf kills increased substantially where open road density exceeded 0.7 miles of road per square mile of landscape."

Revised TLMP FEIS N-36. According to the DEIS, all alternatives will result in road densities between .82 and 2.06 miles per square mile, in violation of TLMP's Standards and Guidelines. See Revised Forest Plan at 4-116, WILD112, XI, A, 1, c The Forest Service must disclose why it has decided that following these Standards and Guidelines is not necessary.

#### **B. The DEIS Fails to Fully Disclose and Evaluate Impacts on the Queen Charlotte Goshawk.**

Although two northern goshawk nest sites were found in the project area, the DEIS fails to adequately disclose and evaluate potential impacts on goshawk populations. The only protective measures identified by the DEIS were a 100-acre core area around one nest site and the location of the other nest site within an old-growth reserve. DEIS 2-18. The DEIS fails, however, to analyze whether this 100-acre buffer complies with the requirements of the Forest Plan :

"Maintain an area of not less than 100 acres of productive old-growth forest (if it exists) generally centered over the nest tree or probable nest site ... Vegetative structure should include a multi-layered, closed (over 60%) forest canopy, a relatively open understory, with large trees .. and low ground vegetation. These conditions generally equate to the high timber volume strata."

See Revised Forest Plan at 4-91, TE&S II, J.

**C. The DEIS Fails to Disclose and Evaluate Impacts on the Forest Old-Growth Reserve Strategy Due to Selection by Private Landowners.**

In their decision not to list the wolf and the goshawk under the Endangered Species Act, USFWS were counting on full implementation of TLMP. The USFWS were counting on a viable system of old-growth reserves across the Forest. Recent selections of areas designated as old-growth reserves by private landowners undermines the integrity of this reserve system. The Forest Service must disclose and evaluate potential effects of pending land selections and land exchanges on Kuiu Island's old-growth reserves. See supra.

**VIII. ALL ALTERNATIVES WHICH AUTHORIZE THE CONSTRUCTION OF NEW PERMANENT ROADS ARE ILLEGAL BECAUSE THE FOREST SERVICE LACKS A FOREST DEVELOPMENT ROAD SYSTEM PLAN FOR THE TONGASS.**

All of the action alternatives in the DEIS require constructing of 6.6 miles of additional permanent roads in the project area. Such roadbuilding plans are illegal and inconsistent with national and regional management direction. See SEACC's Appeal of Revised Forest Plan at 78.

Therefore, in order to consider at least one alternative which meets all the requirements of law, the Forest Service should craft an alternative which doesn't build any new permanent roads. If the construction of permanent roads is necessary, then future development along the road system is reasonably foreseeable and the impacts from such development must be addressed in this EIS.

Simply quantifying impacts with vague statements such as "roads near Class II streams are on steeper slopes and present relatively greater risks to water quality" is inadequate. DEIS 3-38. What are the 2400-17 allowances for post-sale maintenance of these and other roads in the project?

The Forest Planning Regulations enacted pursuant to NFMA state:

"Special attention shall be given to land and vegetation for approximately 100 feet from the edges of all perennial streams, lakes, and other bodies of water...No management activities causing detrimental changes in water temperature or chemical composition, blockages of water courses or deposits of sediment shall be permitted in these areas which seriously and adversely affect water conditions or fish habitat."

36 C.F.R. 219.27(e)(emphasis added). The Preferred Alternative proposes to construct 15 stream crossings, resulting in increased sedimentation and increased risks of stream blockages. Before installing these stream crossings, the Forest Service must fully analyze the topography,

vegetation type, soil, climactic conditions and management objectives for the surrounding areas. Such analysis must show that the location, design and construction of the proposed crossings will not cause a serious adverse effect on water quality or water uses.

The Forest Service must also supply credible monitoring data to show that proposed stream crossing will not cause "... detrimental changes in water temperature or chemical composition, blockages of water courses or deposits of sediment shall be permitted in these areas which seriously and adversely affect water conditions or fish habitat." See 36 C.F.R. § 219.27 (e). For example, the Petersburg Ranger District should fully disclose how many miles of road currently exist in the district, the level of maintenance actually provided those roads, and the condition of all existing culverts and their effectiveness in providing fish passage. The DEIS admits that "[f]ill from a road washed out when a 48-inch culvert was plugged with organic debris or when runoff was too great for the culvert to handle. About 1000 yards of coarse textured road fill entered the stream at this site." DEIS 3-33. The agency should provide the public with a full description of such problems with roads in the district and what is being done to remedy these problems.

The DEIS should also include an alternative which focuses on restoration. Such an alternative could include closing roads, maintenance of the existing road system, culvert and bridge replacement, and watershed restoration projects. According to a March 25, 1997 letter to Governor Knowles, Secretary Glickman stated his support for the Governor's efforts to establish a Southeast Alaska Community Economic Revitalization Team (SEA CERT). The Secretary stated that it was "my understanding that the interagency memorandum of understanding implementing SEA CERT is anticipated to be signed by the appropriate officials in Alaska sometime next month." Has this occurred?

## **IX. THE DEIS FAILS TO FULLY DISCLOSE AND EVALUATE POTENTIAL IMPACTS ON FISH HABITAT AND WATER QUALITY**

### **A. The DEIS's Watershed Analysis is Insufficient.**

1. The Dean and Security Creeks Watershed Analyses fail to follow the guidelines of "Ecosystem Analysis at the Watershed Scale."

According to Appendix J of the Revised Forest Plan, "watershed analysis shall use the basic framework relating to aquatic and riparian resources as described in "Ecosystem Analysis at the Watershed Scale : Federal Guide for Watershed Analysis"(August 1995)." Revised Forest Plan J-1. That document identifies a six step process for conducting ecosystem analysis at the watershed scale. These steps include characterization of the watershed, identification of issues and key questions, description of current conditions, description of reference conditions, synthesis and interpretation of information, and recommendations. Federal Guide at 3 (1995).

Two of the most important steps in this process are the synthesis and interpretation of information, whose purpose is "to compare existing and reference conditions of specific

ecosystem elements and to explain significant differences, similarities, or trends and their causes"; and recommendations, whose purpose is "to bring the results of the previous steps to conclusion, focusing on management recommendations that are responsive to watershed processes identified in the analysis." *Id.* While the Dean and Security Creeks Watershed Analyses provide some valuable information about watershed characteristics, they fail to adequately synthesize and interpret the information presented. While both analyses recommend some restoration activities, neither identify monitoring activities "that are responsive to the issues and key questions" raised by the watershed analyses. *Id.*

## 2. The DEIS Fails to Adequately Disclose and Evaluate the Effects of Logging on Evapotranspiration.

As outlined by the revised Forest Plan, one of the core topics for watershed analysis is watershed hydrology. Forest Plan J-1. In its discussion of watershed analysis, the DEIS fails to fully account for effects of clearcutting on evapotranspiration. In discussing watershed disturbance / second-growth, a recent draft handbook for conducting watershed analysis explains that "[r]emoving timber can result in elevated peak flows, depressed low flows, increase in groundwater tables, and other hydrologic effects. USDA, Alaska Region *Watershed Analysis Handbook* at 25. Decreased low flows result from higher evapotranspiration rate caused by the conversion of old-growth timber stands to vigorously growing second-growth vegetation. Such effects are only visible after second-growth is well-established. The decreased low flows resulting from clearcutting, as well as increases in water yields, can adversely affect fish habitat by changing water temperatures, oxygen levels, and eroding headwaters and channel banks. The failure to fully consider watershed hydrology in a cumulative watershed effects analysis prevents the Forest Service from making a reasoned finding that approved management practices will not "seriously and adversely affect water conditions or fish habitat." *See* 36 C.F.R. § 219.27(e).

### B. The DEIS Fails to Follow the Recommendations of the Alaska Department of Fish and Game (ADF&G).

In its draft report, "Recreational and Commercial Fishery Value," the Alaska Department of Fish and Game outlines its "reserve and restore" strategy, proposed as "the central theme for management in the Tongass - that certain lands are best suited for producing fish and should be kept free of human-caused disturbances." Recreational and Commercial Fishery Value 7.<sup>2</sup> Noting that salmon production and sport fishing use were heavily concentrated in 26% of the VCUs of the Tongass, ADF&G recommended that these VCUs - the Primary Fish Producers - be managed primarily for fish production, at the exclusion of future timber harvest. ADF&G further stated, "[I]n the long term, we believe this strategy will assure the sustainability of the region's commercial, sport, and subsistence fisheries." *Id.* This position is further supported by a recent study completed

---

<sup>2</sup> A copy of this "draft" report is attached. Although we understand that the ADF&G Commissioner's office approved this report, the authors still intend to make minor formatting edits (i.e., page numbers) before it is released formally.

by M.D. Bryant and F.H. Everest: "Management and condition of watersheds in Southeast Alaska. The persistence of anadromous salmon."<sup>3</sup> In their conclusion, the authors state, "The presence, number, and distribution of intact watersheds across the landscape of the Tongass are critical elements for sustainable salmon populations in the face of habitat loss elsewhere in southeast Alaska and the Pacific Northwest." Bryant and Everest 20.

Several streams in the project area qualify as ADF&G Primary Fish Producers, including Kadake Creek, and ADF&G # 109-52-10080 (VCU 402). **The Forest Service should therefore follow ADF&G's recommendations and reserve and restore these watersheds in order to preserve the long-term health of southeast Alaska's salmon stocks.**

#### X. THE FOREST SERVICE NEEDS TO FULLY DISCLOSE AND EVALUATE THE IMPACTS OF THIS TIMBER SALE ON THE U.S. TREASURY

The DEIS fails to consider the economic impact of this timber sale on the U.S. Treasury. Due to high costs of road construction and relatively low returns for Tongass timber, the Tongass timber program loses tens of millions of dollars each year. Most recent estimates indicate that the U.S. Treasury lost over \$30.5 million. See The Wilderness Society, *Double Trouble - The Loss of Trees and Money in Our National Forests* (January, 1998)(attached). The public has the right to know the expected losses that will occur to the U.S. Treasury due to this timber sale.

Please disclose how much this timber sale will cost to prepare and administer. The Forest Service should also disclose how much overhead at the regional office will be expended on this sale and how much available road credits will total for this sale, along with expected payments to communities, considering the possible overhaul of this system through this year's budget process.

With information currently available, one must use FY 1996 data to extrapolate projected losses for this sale. In preparing and selling 120 mmbf on the Tongass in 1996, the U.S. Treasury lost \$30.6 million. For every mmbf of Tongass timber sold, the U.S. Treasury lost over a quarter of a million dollars. Therefore on this 24 mmbf sale, the U.S. Treasury could lose as much as \$6.12 million. The Forest Service must fully disclose and evaluate all potential costs to the U.S. Treasury associated with this timber sale.

#### XI. THE REVISED TLMP VIOLATES NEPA, NFMA, AND THE TTRA BY RECLASSIFYING THE TONGASS TIMBER INVENTORY AND IGNORING THE REQUIREMENT OF PREVENTING THE EARLY DEPLETION OF THE HIGHEST-VOLUME OLD GROWTH ON THE TONGASS

As explained in our appeal of the Tongass Plan, the Forest Service has a duty to accurately and completely identify the location of these stands, and evaluate the impacts of

---

<sup>3</sup> A copy of this study is also attached.

the proposed alternatives on them. See SEACC's Appeal of the Revised Tongass Plan at 85-92. By adopting the new volume strata of the new Forest Plan and failing to disclose the extent of proposed logging of VC 6&7 stands, the Forest Service has substantially impaired the public's ability to make informed decisions about impacts from this proposed project. This violates NEPA. The Forest Service has shown that such analysis is indeed possible. The Crystal Creek Timber Harvest DEIS revealed how much logging was proposed for VC 6&7 in that timber sale. See Crystal Creek Timber Harvest DEIS at 3-8. The Forest Service must disclose this information and assure the public that it is not highgrading the project area with this proposed sale and therefore violating TTRA and the diversity requirements of NFMA. By failing to provide accurate data on where the most productive forests occur in the project area, the DEIS violates NEPA.

## XII. THE DEIS FAILS TO DISCLOSE AND EVALUATE IMPACTS ON ROADLESS AREAS.

Pending a decision on our TLMP Appeal and completion of the recently initiated national review on managing roadless areas, it is premature for the Petersburg Ranger District to begin the planning process for timber sales which build roads into roadless areas. Such a delay is not imprudent given the amount of timber currently under contract to the industry.

The Forest Service has a responsibility to protect the long-term health of fish and wildlife in the area and to manage the area for the long-term benefit of all its uses, including commercial and sport fishing, hunting, tourism, recreation, and subsistence. One way of fulfilling this responsibility is to stop building new roads into currently unroaded areas. The DEIS should disclose the amount of available, and scheduled timber within the Petersburg Ranger District within one-mile of existing roads, and explain the justification for entering this roadless area now instead of providing timber volume from those already roaded areas. The Forest Service should also disclose and evaluate impacts on roadless areas due to each alternative. Finally, in order to consider a reasonable range of alternatives, the Forest Service should consider at least one action alternative which logs without building roads into roadless areas.

## XIII. THE DEIS FAILS TO ADEQUATELY DISCLOSE AND EVALUATE IMPACTS ON CULTURAL RESOURCES, IN VIOLATION OF THE NATIONAL HISTORIC PRESERVATION ACT (NHPA).

Section 106 of the NHPA requires the Forest Service to perform an effects analysis on all historic resources which meet informal criteria, not just those sites formally found to be eligible for listing in the National Register of Historic Places. Even an informal finding of eligibility triggers the necessity to perform an effects analysis. See 36 C.F.R. § 800.4( c). Therefore, the Forest Service must disclose and evaluate all potential direct, indirect, and cumulative impacts on all sites which were found at some point to be potentially eligible for inclusion in the National Register.

According to the DEIS, there are a total of at least 107 potential heritage resource sites in the project area. DEIS 3-66. The National Historic Preservation Act (NHPA) requires the Forest Service to evaluate the entire project area to determine existing and potential heritage sites reasonably expected to be directly or indirectly affected by the proposed project. See 36 CFR 800.2(o).

According to the DEIS , 249 culturally modified trees were found in four harvest units within the project area. DEIS 3-68. The Forest Service then goes on to state :

"[t]he fact that they are scattered and lack associated sites or artifacts indicates they are not significant...[they] are not eligible for the National Register of Historic Places."

DEIS 3-68. The Agency lacks a reasonable basis for this conclusion.

Federal regulations require the Forest Service to "seek and consider the views of the public when taking steps to identify historic properties, evaluate effects, and develop alternatives." 36 CFR 800.1( c)(2)(iv). The Forest Service must disclose what public involvement was considered in evaluating the significance of the CMTs and their eligibility to the National Register. According to National Bulletin No. 38, a "traditional cultural property" is eligible for inclusion in the National Register if its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. The Forest Service must disclose and evaluate in this DEIS whether the CMTs meet these criteria. Failure to consider these criteria in the step-by-step public process violates the NHPA. The Forest Service must also disclose what mitigation will be done to minimize impacts on these trees. At a minimum, the agency must consider action alternatives which do not include logging in these units.

The Forest Service states , "[i]mplementation of a 1,000-foot beach fringe and estuary buffer zone effectively minimizes the probability of impacting heritage resources." DEIS 3-69. This statement fails, however, to disclose and evaluate the impacts associated building roads within the beach fringe and estuary buffers, as well as past impacts due to management activities within these areas .

The Forest Service concludes that "[w]e determined that there are no historic properties (sites eligible to the National Register of Historic Places) within the area of potential effect for this project." DEIS 3-69. The agency lacks a reasoned basis for this conclusion and violates the NHPA because it failed to evaluate and disclose the potential direct, indirect, and cumulative impacts on all sites which were ever potentially eligible for inclusion in the National Register in this DEIS.

XIV. THE FOREST SERVICE HAS FAILED TO PROVIDE A SOCIOECONOMIC ANALYSIS, IN VIOLATION OF NEPA.

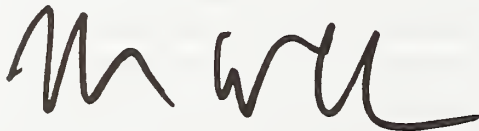
Federal regulations state:

"When an environmental impact statement is prepared and economic or social and natural or physical environmental effects are interrelated, then the environmental impact statement will discuss all of these effects on the human environment."

See 40 CFR 1508.14. Because this timber sale will have an effect on the economic and social environment, the Forest Service must analyze these impacts in this DEIS. Failure to disclose and evaluate impacts due to this timber sale on recreation and tourism businesses, subsistence users, commercial and sport fishing interests, among others, represents a violation of NEPA.

Thank you for carefully reviewing these comments.

Best Regards,

A handwritten signature in black ink, appearing to read 'M Wheeler', with a stylized, cursive script.

Marc Wheeler  
Special Projects Coordinator



File Code: 1950

Date: June 30, 1998

Marc Wheeler  
Southeast Alaska Conservation Council  
419 6th Street, Suite 328  
Juneau, AK 99801

Dear Mr. Wheeler:

Thank you for your comments on the Draft Environmental Impact Statement for the Crane and Rowan Mountain Timber Sales. In response to your letter, changes have been made, where appropriate, in the Final EIS. This letter and a copy of your letter dated March 30, 1998, will be printed in Appendix C of the Final EIS. The following replies are in the same order as the comments in your letter.

***Manipulating the broad goals and objectives in TLMP to achieve a preconceived outcome violates NFMA.***

The purpose and need for this project is to respond to the goals and objectives identified in the Forest Plan and to move the project area towards the desired future condition. The amount of timber volume to be harvested has not been predetermined. The analysis provides a range of alternatives from 0 to 24 mmbf. All five are viable alternatives. The entire Crane and Rowan Mountain project area is allocated to the Timber Production Land Use Designation. The Forest Plan goals you referred to are those identified specifically for this land use designation. These goals are listed on page 3-144 in the 1997 Forest Plan. Also, see chapter 2 of the DEIS for a description of Alternative 2, the proposed action. The proposed action is Alternative 2, and the preferred alternative is Alternative 4.

***The Forest Service violates NEPA by using the "desired future condition" to restrict the range of alternatives.***

The no-action alternative (Alternative 1) is given meaningful consideration in all the analysis throughout the FEIS. The "desired future condition" established in the Forest Plan is an appropriate consideration in alternative development.

***The Forest Service must eliminate the 24 MMBF timber target.***

The Stikine Area Timber Sale Schedule represents a reasonable solution to meet the Forest Plan goals and objectives while providing a wide variety of timber harvest opportunities. The sale schedule shows how harvest could occur across suitable lands consistent with the Forest Plan standards and guidelines, best management practices and other resource protection requirements.



There is no timber target for this project area. The volume estimates for the Crane and Rowan Mountain area on the timber sale schedule were based on harvest units from the North and East Kuiu EIS after the AWRTA settlement agreement. These units, adjusted for the new Forest Plan standards and guidelines, are similar to Crane and Rowan Mountain's Alternative 2, the proposed action. A range of alternatives were developed by the interdisciplinary team based on issues and public comments. Alternative 4, which is based on concepts of disturbance ecology, is the preferred alternative in the DEIS. (See page 1-1 of the DEIS.)

*The DEIS's claim regarding the extent of subsistence use is not supported by fact.*

We recognize that Kuiu Island is historically important for subsistence users from Kake. Since 1972, deer populations have been low and Kuiu Island has not been heavily used for subsistence deer hunting. This has been clarified in the FEIS.

*The DEIS's analysis of impacts on subsistence is not supported by fact.*

The Subsistence Specialist Report, contained in the planning record, gives a more detailed description of subsistence uses within the project area and the potential for impacts to subsistence use of deer. However, in response to your comments, we are including much of this information in the FEIS.

The major reason there is a different subsistence finding between the Crane and Rowan mountain EIS and that in the North and East Kuiu EIS is that different areas are analyzed. Deer subsistence analysis has been conducted on each Wildlife Analysis Area (WAA) within the project area. The North and East Kuiu EIS found that a restriction to subsistence use would occur in WAAs 5014 and 5018. However, the Crane and Rowan project area does not include either of these WAAs. (Please see North and East Kuiu EIS pages 3-105 through 3-108.) The North and East Kuiu EIS analysis did show a restriction to subsistence for Alternative 2 due to harvest in WAA 5018. In this WAA, there is a significant restriction even with the no-action alternative because hunter demand exceeds habitat capability.

Another significant change from the north and East Kuiu EIS is that the analysis in the Crane and Rowan Mountain Timber Sales EIS uses an updated model for predicting deer habitat capability (Version 7.0.1), and applies the standards and guidelines from the 1997 Forest Plan. Version 7.0.1 was developed by an interagency modeling team in response to new information and a better understanding of relationships between deer and their habitat. Because of the new model, and especially because of the application of the 1997 Forest Plan standards and guidelines, the analysis shows less impact to deer habitat than the analysis conducted for the North and East Kuiu EIS.

*The Forest Service's failure to hold an 810 hearing in Kake violates ANILCA.*

Our analysis shows that there will not be a significant possibility of a significant restriction to subsistence use of deer from any alternative in the Crane and Rowan Mountain project area. Therefore, holding an 810 subsistence hearing is not appropriate. We have conducted other public meetings and an open house in Kake to discuss the Crane and Rowan Mountain project.

*The DEIS fails to follow the agreement reached in the AWRTA settlement.*

Three meetings were held in Kake as directed by the AWRTA v. Morrison settlement to discuss management of Kuiu Island including the Crane and Rowan Mountain Timber Sales. These meetings were held May 21, June 11, and August 2, 1996. The report on the workshops is available in the planning record for this timber sale as well as in the public record for the Tongass Forest Plan revision. It is referenced in the FEIS.

The concerns of the Organized Village of Kake about access management in the Kadake Bay drainage are addressed in the FEIS. All new roads proposed for this timber sale, including those in the Kadake watershed, will be closed when the sale is complete in order not to increase access in this watershed. In addition, other roads no longer needed for timber management purposes will be closed as the result of the Kadake Creek watershed analysis and road management objectives in Appendix A of the FEIS.

*The Forest Service violated NEPA by restricting the scope of this DEIS to exclude consideration of other pending proposals which may have significant cumulative impacts on Kuiu Island, its resources, and the people who depend on those resources.*

The analysis in the EIS does include the potential impacts of the Saginaw and Rowan settlement timber sales. The FEIS discusses the possible impacts of future timber sales on East Kuiu; however, this is highly speculative at this time because they are in the very preliminary stages of planning. Some discussion of potential impacts of the Gunnuk Creek land exchange (S.1159) is contained in the FEIS even though this too is quite speculative at this time.

Connected actions are actions that are dependent on each other. See CEQ regulations 40 C.F.R. § 1508.25 (a)(1)(i)(ii)(iii). Since these projects can be undertaken independently and do not meet the CEQ definition, they are not considered connected actions.

*The Forest Service's decision to restrict the scope of the Crane-Rowan Mountain DEIS to this single project prevents it from educating itself and others about the larger context in which decisions affecting the environment of the surrounding area are made, thereby reducing the quality of the decisions made and rendering the EIS inadequate.*

Mid-level planning is neither a Forest Plan nor a NEPA requirement. The cumulative effects of past, present, and reasonably foreseeable future actions are evaluated in the FEIS.

The ecological information for the Crane and Rowan Mountain project area is the best information available. Ecological information was collected specifically for this project including detailed stream inventories, disturbance ecology data, stand structural data, ecomap/geomorphic inventory, etc. We think this level of ecological analysis provides a sound scientific basis for the design of this project.

*All action alternatives violate the TTRA because they offer timber in excess of likely market demand.*

Appendix A, of the DEIS which discusses market demand and timber harvest scheduling, has been revised and is now located in the planning record.

As in the rest of the world, timber demand in Southeast Alaska fluctuates dramatically on an annual basis. Periodic shortages or surpluses of timber to meet market demand does not constitute a violation of TTRA. The level of demand is difficult for the Forest Service and timber industries to predict with any precision. Demand is not a single number. It is influenced by complex interactions that include interest rates, housing starts, value of the dollar, changes in export policies, and business cycles. The Brooks and Haynes figures are based on global demand and minor changes in assumptions could mean large-scale differences in demand for Alaskan timber products.

In order to maintain a stable timber sales program, the Forest Service needs to provide a sustainable and continuous flow of timber to the public. The Forest Service is not offering timber in excess of demand. It takes approximately 3 years to progress through the NEPA process and sale preparation. The Stikine Area has sold all recent timber sales that have been advertised. This indicates that the supply for National Forest timber has not exceeded demand.

*The DEIS fails to disclose and evaluate how recent round log exports affect market demand estimates.*

The actual amount of timber exported from the Tongass National Forest in 1997 was 38 million board feet. By permitting some export of unprocessed logs, the Forest Service has successfully helped many timber purchasers remain in business. The Forest Service is acting to support key ideas of the Governor's Timber Task Force Report and helping to respond to the needs of an emerging value-added wood processing industry.

The Alaska Region of the Forest Service drafted new timber export procedures and solicited public comments on these procedures in April 1998. The proposed policy responds to Section 347 of the Department of Interior and Related Agencies Appropriations Act of 1998 (PL 105-83).

No wood has been exported from either the Saginaw or Rowan Settlement timber sales purchased by Rayonier Incorporated since logging has not started on either sale. Rayonier is authorized to export wood under a settlement agreement reached after the AWRTA v. Morrison litigation.

The Crane and Rowan Mountain Timber Sales will be sold under the competitive bid process for independent timber sales. It is inappropriate to speculate on which companies may bid on the sales.

*The use of the Nowacki, Kramer study in this DEIS is inappropriate.*

The ecological basis for the disturbance ecology principles used in this project are well documented in the scientific literature. The masters thesis by Mark Kramer which is specific to Kuiu Island, and the paper by Nowacki and Kramer cited in the DEIS have been thoroughly peer reviewed. We are also using the principles of Forest Stand Dynamics by Oliver and Larson. Studies on Kuiu Island and elsewhere have identified both even-aged stands and multiple cohort stands resulting from wind

disturbance. We have tried to emulate these stand types as well as their arrangement in the landscape in determining harvest prescriptions for this timber sale.

***The DEIS fails to disclose and evaluate impacts on the Alexander Archipelago Wolf.***

A summary of the Biological Evaluation discussing impacts to the Alexander Archipelago Wolf has been added to the FEIS. A complete discussion of environmental effects on wolves, including available scientific literature, is located in the Biological Evaluation in the planning record.

The number of deer needed to sustain wolf populations and allow deer hunting to continue is 18 deer per square mile. The analysis conducted for the Forest Plan (Iverson 1997) indicates that currently deer density in WAA 5012 is 27 deer per square mile and will be reduced to 18 deer per square mile in the year 2095 if the Forest Plan is fully implemented on Kuiu Island.

Wolves are impacted by the people using the roads, not the roads themselves. The road density thresholds developed from studies on Prince of Wales Island (Person et al, 1996, 1997) should only be applied to islands with similar road use patterns. Unlike Prince of Wales Island, Kuiu Island has no permanent communities and is not connected to the ferry system. Dave Person, in a memo entitled "Analysis of deer harvest and road data" and addressed to Moira Ingle, Doug Larsen and Matt Kirchhoff of ADF&G states: "The data shown are only for WAAs on Prince of Wales Island. The dynamics and relations that may exist on the other islands in the region may be different from POW because they do not have the human population and access to a ferry system, which can transfer automobiles." None of the alternatives for this project will change the amount of open roads on Kuiu Island as all proposed roads will be closed after logging is complete.

An analysis of the deer density per square mile is available in the Subsistence Specialists Report and the Wildlife Specialist Report in the planning record.

***The DEIS fails to fully disclose and evaluate impacts on the Queen Charlotte Goshawk.***

Forest Plan standards and guidelines were developed by an interagency team for the protection of the Northern Goshawk. These guidelines have been applied to the Crane and Rowan Mountain area. There are two goshawk nests known to exist in the project area. A 100 acre buffer has been placed around the inactive nest near Rowan Creek. The other nest near Fall Dog Creek was active in 1997 and is located in an Old Growth Land Use Designation that will not be harvested. If other goshawk nests are found in the project area, the buffer requirements in the Forest Plan standards and guidelines will be implemented.

***The DEIS fails to disclose and evaluate impacts on the forest old-growth reserve strategy due to selection by private landowners.***

All Old Growth Reserves located on Kuiu Island meet the requirements of the Forest Plan. When land selections are submitted to the BLM for conveyance, the Forest Service in cooperation with the U.S. Fish and Wildlife Service and the Alaska Department of Fish and Game will evaluate the functionality of the remaining viability strategy. If a change in land allocations is deemed necessary to achieve the Forest Plan old growth strategy standards and guidelines, the Forest Plan will be amended to ensure the old growth conservation strategy is maintained.

*All alternatives which authorize the construction of new permanent roads are illegal because the Forest Service lacks a forest development road system plan for the Tongass.*

The Forest Service maintains a Forest Development Transportation Plan in accordance with direction found in Forest Service Manual 7711. This plan is the official description of the forest development transportation system and consists of a base map or series of base maps showing the location of each facility and an inventory record defining their characteristics. These documents also serve as the forest development road system plan referenced in the National Forest Management Act. The key point is that this plan is a description of existing permanent roads.

The Forest Service has fully analyzed the stream crossing sites as you have suggested, including topographic survey, contributing watershed area, and future management objectives. No fish passage will be blocked at any of the crossings (only two sites are resident fish habitat). Our road management objectives for all the new roads in this project call for temporary structures. Therefore, many of the crossings have been designed with removable bridges. This will minimize sediment input to streams initially and after the structure is removed at the end of the sale. We believe these measures will prevent any serious adverse effect on water quality or fish habitat.

With regard to the road maintenance program, we are currently working cooperatively with the Alaska Department of Fish and Game to catalogue all road maintenance needs on the Stikine Area (including possible fish passage problems). We expect to have accomplished 80% of the basic inventory by the end of this field season. The current inventory is available for inspection at the Forest Service office in Petersburg.

Our preferred alternative does focus on restoration activities. In addition to storing all new roads after sale completion (removing or bypassing all drainage structures to restore natural drainage patterns, providing additional waterbars as needed to control runoff, and revegetation), we will also provide this same treatment to 4.1 miles of existing road. In addition, we have secured funding for carrying out the road storage work that was recommended in the Security Creek Watershed Analysis.

The actual post-haul maintenance allowance for this timber sale will not be calculated until the appraisal is prepared (post Record of Decision). Allowances for similar work on five miles of road in the King George Timber Sale were \$18,560, or approximately \$3,700 per mile.

*The DEIS's watershed analysis is insufficient.*

A watershed analysis report was completed for both Security Creek and Dean Creek watersheds. These analyses are available upon request. No other watersheds within the project area are near the threshold of concern outlined in Appendix J of the 1997 Forest Plan.

Increased evapotranspiration was considered in the watershed analysis report for Security Creek. The effect of evapotranspiration created by the conversion of old-growth timber to vigorously growing second-growth is not well understood in Southeast Alaska. To date, only one short-term study has been completed. This study indicates that low flow water yield may increase following clear-cut harvest (Bartos, 1989). Cool temperatures, long duration rainfall, and decreased interception loss may all work to increase rather than decrease low flow response. The effect on evapotranspiration during large flows may be minimal, as these floods typically occur during periods

when precipitation is of long duration and moderate intensity. During these times, both the canopy and soils become saturated regardless of the age of the forest cover. Based on the available information, we have determined that the risks of adverse waterflows from increased evaporation and/or transpiration from the Crane and Rowan Mountain alternatives are minimal.

***The DEIS fails to follow the recommendations of the Alaska Department of Fish and Game.***

The draft Recreational and Commercial Fishery Value Report is not the official position of the State of Alaska. The Forest Service decided in the 1997 Forest Plan, with concurrence from the State of Alaska, that all anadromous streams would receive equal protection. These riparian standards and guidelines are applied to all streams within the project area.

***The Forest Service needs to fully disclose and evaluate the impacts of this timber sale on the U. S. Treasury.***

National Forests are managed for a variety of uses, one of them being timber production. National Forests are not necessarily managed to give the greatest dollar return to the Treasury.

It is not possible to give the exact cost to prepare and administer the Crane and Rowan Mountain Timber Sales as each sale is different depending on size, location, timber quality, etc. The latest figures we have for average Stikine Area costs are \$41 per mbf (thousand board feet) for planning and NEPA analysis; \$23 per mbf for sale preparation and offering; \$9 per mbf for sale administration; and \$28 per mbf for engineering and road design.

***The revised TLMP violates NEPA, NFMA, and the TTRA by reclassifying the Tongass timber inventory and ignoring the requirement of preventing the early depletion of the highest volume old growth on the Tongass.***

The Crane and Rowan Mountain Timber Sales are planned for independent sales and so proportionality does not apply. A map showing volume strata and proposed harvest units is included in the FEIS.

***The DEIS fails to disclose and evaluate impacts on roadless areas.***

Planning efforts that include building new roads do not need to be delayed pending Forest Plan appeals. The Record of Decision (page 43) of the Forest Plan signed May 23, 1997, states that requests to stay approval of the Forest Plan will not be granted.

The Forest Service uses the Recreation Opportunity Spectrum to evaluate impacts to roadless areas. The impacts to roadless areas, in terms of the Recreation Opportunity Spectrum, are evaluated in chapter 3 of the FEIS.

The interdisciplinary team decided not to develop an alternative that harvests timber without building new roads. Such an alternative would be viable only if our purpose was simply to meet a timber target. However, our purpose and need, as stated in the FEIS, is to meet the goals and objectives identified in the Forest Plan for the Timber Production Land Use Designation. These objectives are best met by developing a road system to facilitate the long-term management of the area. Please see page 3-144 of the 1997 Forest Plan.

***The DEIS fails to adequately disclose and evaluate impacts on cultural resources, in violation of the National Historic Preservation Act (NHPA).***

We considered the effects to all heritage resource sites in the project area that are eligible for inclusion in the National Register of Historic Places. We considered all potential direct, indirect and cumulative impacts and we determined that no eligible sites would be affected. The Alaska State Historic Preservation Officer concurred with our determination. With the exception of some of the 249 recorded culturally modified trees, none of the known study area sites, including those not eligible to the National Register, will be adversely affected by the proposed timber sale.

The Alaska Office of History and Archaeology does not recognize culturally modified trees as heritage sites nor do they meet the eligibility criteria for the National Register of Historic Places.

Eliciting the views of the public for the Crane Rowan Mountain DEIS is an appropriate method of public involvement for the Section 106 process. We recognize the cultural importance of Kuiu Island to the Tlingit people. We have not, however, received information on culturally modified trees that would result in a determination that they are eligible for inclusion in the National Register.


Archaeological survey data compiled over the last 20 years clearly demonstrates that most heritage sites are located a short distance from the coastline. One thousand foot beach fringe and estuary buffer zones effectively minimize the probability of impacting these heritage resources. No roads are planned to be constructed in the buffer zones as a result of the proposed timber sale.

The EIS provides a summary of our study of heritage resources in the project area. A more detailed report was prepared and submitted to the Alaska State Historic Preservation Officer.

***The Forest Service has failed to provide a socioeconomic analysis in violation of NEPA.***

We have considered social and economic effects as well as the physical and biological environmental effects. The impacts to recreation and tourism are discussed in DEIS page 3-53. Impacts to subsistence users is discussed in DEIS page 3-60 and 61. Impacts to fisheries is discussed in DEIS page 3-57 to 59. More detailed analysis and supporting technical information for these resource analyses are available as specialist reports, watershed analysis, etc., in the planning record.

Sincerely,



CAROL J. JORGENSEN  
Assistant Forest Supervisor



# United States Department of the Interior

OFFICE OF THE SECRETARY  
Office of Environmental Policy and Compliance  
1689 C. Street, Room 119  
ANCHORAGE, ALASKA 99501-5126

Received

APR 6 1998

Tongass N.F.

ER 98-59

April 1, 1998

Mr. Everett Kissinger  
U.S. Forest Service  
Tongass National Forest  
Stikine Area  
P.O. Box 309  
Petersburg, Alaska 99833

Dear Mr. Kissinger:

In response to your December 31, 1997, request, we have reviewed the Draft Environmental Impact Statement (EIS) for the Crane and Rowan Mountain Timber Sales in the Tongass National Forest, Petersburg Ranger District, in which the U.S. Forest Service (USFS) proposes harvesting approximately 17 to 24 million board feet of timber on North Kuiu Island. We offer the following comments for your consideration.

We are primarily concerned with the effects of the proposed action on fish and wildlife habitats and populations and the resulting potential impacts on opportunities for fish and wildlife-oriented recreation. Issues of particular interest include those related to old growth habitat and connectivity, road management, and wolf and deer populations.

## NATURAL DISTURBANCE ECOLOGY AND CUMULATIVE EFFECTS

In a November 3, 1997, letter, the Fish and Wildlife Service (FWS) expressed concerns for the cumulative effects of this project in combination with other on-going and proposed timber harvests on Kuiu Island. We remain concerned about the cumulative effects of this project in combination with other on-going and proposed timber harvests on Kuiu Island, particularly in relation to long-term species viability. We suggest an island-wide cumulative impacts analysis be conducted to avoid deleterious effects caused by piecemeal logging of forested habitat, and that the results be discussed in the Final EIS.

Implementing several small timber sales in an area already heavily harvested and roaded, such as North Kuiu Island, could, we believe, eventually cause irretrievable long-term effects on wildlife populations throughout the area. Although old growth reserves (OGRs) have been established in the management area, we believe it is important to manage the highly fragmented forested areas between them in a manner that the reserves do not become isolated patches no longer capable of independently sustaining old-growth dependent wildlife populations.

The Draft EIS states that the proposed project is designed to mimic natural disturbance processes across the landscape to address forest fragmentation and connectivity. The Draft EIS addresses this process on two levels; the stand level and landscape level. We are pleased that the USFS is integrating alternatives to clearcutting into timber harvest projects. However, on a landscape scale, past and planned timber harvests on Kuiu Island are in excess of the rate of natural disturbance by a ratio of 2:1, clearcutting to medium- and high-intensity blowdown (Nowacki and Kramer 1998). Given the extent of past harvest on the island, we believe that it may be too late to mimic natural disturbance at a landscape scale on Kuiu Island.

Nowacki and Kramer (1998) recommended emulating gap-phase forest regimes on north facing slopes. The trees on these slopes grow much slower than those on other aspects, and they contain the oldest and largest stands because they are protected from windthrow. However, the Draft EIS states that the USFS concluded that only clearcutting and two-aged harvest systems are needed to meet habitat conservation objectives. We believe that the Final EIS should include single tree or small group selection harvests on north facing slopes (Units 399-13 and 400-18) as an alternative, thereby increasing the potential to maintain biodiversity in the project area. The units on the east facing slopes in the Security area should also be managed using single tree or small group selection harvests because they are in a moderate to low wind probability area (page 3-19).

The term “maintain natural disturbance” is used throughout the Draft EIS as an outcome of timber harvest. In Chapter 3, page 2, the Draft EIS states it will discuss the degrees to which each alternative “maintains” natural disturbance patterns. In Chapter 2, page 14, the Draft EIS states Alternative 4 would “better maintain” natural disturbance by dropping a sale unit and modifying another. Realistically, the way to maintain natural disturbance is to do nothing at all and let the natural forces (i.e., wind) take place. We suggest the terms “consistent with natural disturbance” or “mimic natural disturbance” be used in the Final EIS when discussing attempts to imitate natural forest disturbance events and habitat conditions.

We suggest that all units identified in the Final EIS with a clearcut prescription be limited to 50 acres or less under any alternative selected, as recommended by Nowacki and Kramer (1998). Most blowdown patches on Kuiu Island were found to be less than 50 acres.

Unit 8 in Value Comparison Unit (VCU) 400 in the North and East Kuiu project plan was originally designed to provide a wildlife corridor from Security Creek to the ridge above the units. Now the unit appears to cross this corridor. As stated in the FWS November 1996 letter to you, we suggest that the Final EIS address this issue and present an analysis as to how this unit will affect wildlife movements along this corridor.

## OLD GROWTH HABITAT STRATEGY

As the Draft EIS states, the FWS has expressed concern for the location of the small OGRs (OGR) and old-growth connectivity in the project area during various meetings, and in their November 1997 letter. The Tongass Land Management Plan (TLMP) Record of Decision (page 33) states that interagency reviews are to be conducted regarding the location of small OGRs in project areas. TLMP's Management Prescriptions for Old-Growth Habitat (page 3-82) allow for the project level analysis of reserves that are adjacent to project areas. We recommend convening an interagency meeting, including representatives of the FWS, USFS, and Alaska Department of Fish and Game (ADFG), to discuss the locations of the small OGRs on Kuiu Island. We also suggest that an island-wide habitat analysis be conducted. Such an analysis would be a good first step to avoid deleterious cumulative effects on Kuiu Island that could be caused by piecemealing projects.

## ALEXANDER ARCHIPELAGO WOLF AND SITKA BLACK-TAILED DEER

The Draft EIS refers the reader to the project biological evaluation in the planning record. We believe the Final EIS should discuss project impacts to the local wolf population as requested in the FWS November 1997 letter to the USFS.

The biological evaluation (page 8) states that the FWS "rejected" the petition to list the Alexander Archipelago wolf under the Endangered Species Act (ESA) because of the habitat protection provisions of TLMP. The FWS's August 1997 decision not to list the Alexander Archipelago wolf as threatened or endangered under the ESA was based on implementation of the 1997 TLMP provisions. However, it was also based, in part, on the TLMPs predicted influence on wolf and deer populations as addressed in The Alexander Archipelago Wolf: A Conservation Assessment (Person et al. 1996). We suggest this expanded discussion be included in the Final EIS.

The Draft EIS states, on page 10 of Chapter 3, that the effects of the project alternatives were analyzed by the Interagency Deer Model. The discussion does not clearly indicate whether the deer model used is the 1991 or 1997 version. The biological evaluation states (page 12) that conclusions regarding the impacts on the Alexander Archipelago wolf are based on the "Wolf Assessment" used for the TLMP. It does not cite the "Wolf Assessment" in the Table of Authorities. We recommend that these documents be included in the Final EIS Literature Cited.

The project biological evaluation uses the TLMP provisions to imply that the project would have no negative effects on the wolf population in the project area (page 12). It states that this conclusion is based on three findings using the "Wolf Assessment." We assume that the "Wolf Assessment" is referring to The Alexander Archipelago Wolf: A Conservation Assessment (Person et al. 1996). This should be clarified in the Final EIS. We believe that these three findings misrepresent the wolf assessment (Person et al. 1996) for the reasons stated below. The biological evaluation conclusion is contradictory to the concerns stated in the wolf assessment and

the wolf assessment authors' subsequent, September 19, 1997, letter to the USFS. We recommend the Final EIS be modified to include these discussions:

1) The biological evaluation's first finding combines Kuiu, Kupreanof, and Mitkof Islands for the effects analysis, but does not consider cumulative impacts of the wolf population on Kuiu Island alone. The supposition in the biological evaluation (page 3) is that the wolf population on Kuiu Island is increasing, as the island has nearly identical conditions as other areas of the Tongass Forest with increasing wolf populations. This suggests that there is no information available regarding the Kuiu Island wolf population trend. The biological evaluation (page 6) states that "the population of wolves on Kuiu has been rather stable and even increasing," but it does not give a source or basis for this statement. The biological evaluation then concludes that the hunting and trapping seasons have not had an appreciable effect on the island's wolf population. We suggest that Kuiu-specific information, with sources, be included in the biological evaluation in the Final EIS.

2) The second finding (page 12 of the project biological evaluation) characterized the analysis as "conservative," using the deer habitat capability benchmark of 13 deer/mile<sup>2</sup>. Person et al. (1996) recommended an actual density of 13 deer/mile<sup>2</sup> (actual deer) as a minimum within areas where logging occurs in order to reduce long term risk to wolf viability. They also recommended a reserve system with an average density of 18 deer/mi<sup>2</sup>, which would have a high probability of sustaining wolf numbers sufficient to produce wolves likely to disperse. In a subsequent (September 19, 1997), letter to the USFS, Person and others recommended a habitat capability of at least 18 deer/mi<sup>2</sup> to maintain adequate deer populations within areas subject to timber harvest. We recommend that the USFS refer to Person et al. (1996) and the subsequent, September 19, 1997, letter to the USFS written by the same authors when applying the wolf standards and guidelines, particularly regarding the habitat carrying capacity for deer required to maintain wolf populations.

3) The third finding in the biological evaluation states that wolf mortality and access management will be addressed through a reasoned, site-specific analysis process to be conducted in cooperation with the FWS and the ADFG. This evaluation has not yet occurred for Kuiu Island. The following are our comments addressing this issue.

On page 9 of the biological evaluation, four risk factors for wolf populations are listed from Kirchhoff (1991), including: liberal trapping and hunting regulations, high road densities, reduced prey populations in areas of intensive logging, and inbreeding depression within insular populations. It also states that Kuiu Island has all of these factors except "inbreeding depression within insular populations," as Kuiu Island is said to be "well connected" with other islands and

animals migrate between them. The Draft EIS implies a high degree of certainty in this conclusion, and although interconnectivity may occur, we are aware there are few data to support such a conclusion. We recommend that the Final EIS discuss the available scientific literature regarding wolf movement in Southeast Alaska, particularly relating to the interaction of wolves on Kuiu Island with those on adjacent islands.

The biological evaluation then discounts the other three wolf risk factors present on Kuiu Island, and states that trapping and hunting regulations are not a major factor, as the island is relatively inaccessible during winter months when more of the hunting and trapping occurs. However, the Draft EIS also states that hunting and trapping occurs on Kuiu Island (Chapter 3, page 5). The third risk factor is high road densities, which occur in this project area. The biological evaluation states that existing and proposed road densities are not an important issue because there is no permanent settlement on Kuiu Island and roads are not heavily used. However, the Draft EIS (Chapter 3, page 44) states that outfitter and guide use is expected to increase. Small groups of hunters and trappers, and other larger (nonhunting) groups use the island as well. We suggest these contradictions be clarified in the Final EIS.

In a November 3, 1997, letter, the FWS expressed concern for impacts to wildlife populations due to increased human access via an expanding road system in the project area, and recommended that effects of increased human access on local wolf, deer, and martens be evaluated and disclosed in the Draft EIS. Public use on Kuiu Island may be relatively low now, but the North and East Kuiu Timber Sale Final EIS states that the USFS predicts public use on the island will increase. As the human population in Southeast Alaska increases, demand for game species will also increase. Many of the impacts to fish and wildlife that result from timber harvest programs are directly and indirectly related to construction and use of roads.

Road densities were disclosed in the Watershed Effects section, but not discussed in the wildlife section. The Draft EIS (Chapter 3, page 35) shows road densities in the entire project area range from 0.82 to 0.98 miles per square mile for open roads and 1.6 to 2.06 miles per square mile for all roads in currently roaded watersheds. All the proposed action alternatives would increase these densities.

Planning direction in the current TLMP sets no threshold for road densities, relying instead on these case-specific evaluations. Analyses reported in the wolf assessment (Person et al. 1996) determined that wolf mortality is correlated with road mileage, and reported that harvest of wolves doubles where road densities average 0.66 miles per square mile; triples at 1.19 miles per square mile; and quadruples at 1.63 miles per square mile; in comparison to unroaded conditions. The project area is within the ADFG's Wildlife Analysis Area (WAA) 5012 (North Kuiu), which has an open road density of 1.36 miles per square mile, according to Appendix 13 of TLMP's Appendix N. As human populations increase, this current road density in the WAA would subject wolves to at least tripled harvest pressure.

Dave Person also analyzed USFS Geographical Information System data and deer harvest statistics published by ADFG for Game Management Unit 2 (Enclosure 1). He determined that the data showed the average hunter deer kill per WAA was strongly correlated with the number of hunter days and that there was a positive relation between the length of road and the effort expended (number of hunter days). Therefore, the average deer kill is strongly correlated with the length of roads ( $r=0.714$ ). He concluded that there is reasonable evidence that roads, development, and human populations may have a negative effect on deer numbers.

The Draft EIS states that the USFS does not expect the increase in human access would reduce subsistence harvest and that the habitat capability should be sufficient to meet increased demands. However, habitat capability could be high while the deer population is low for the reasons stated above.

The Draft EIS also states that closing new roads will further mitigate effects of access. Road closures are not always effective in preventing access to all-terrain vehicles. Recent monitoring efforts in which the FWS participated have shown inconsistent approaches to “closing” roads. Road removal, and reestablishment of original contours, may be most effective at avoiding future impacts. We support the removal of culverts on abandoned roads that remain after the harvest. Otherwise, the culverts are likely to become plugged with debris and result in mass failures of the roadbed. Alder growth can be accelerated by sowing the roadbeds with alder seed, which can be purchased or collected locally. We recommend cutting alder branches in the fall, and spreading them on closed roadbeds as a seed source.

Effects of increased human access on local wolf packs, deer, and martens should be evaluated and disclosed in the Final EIS. We suggest that the Final EIS identify roads that would be closed so that open road density is kept less than 0.7 linear miles per square mile during and after project implementation. We further recommend a plan be presented in an island-wide analysis (recommended above) for closing roads no longer needed.

The fourth risk factor for the Kuiu Island wolf population listed in the biological evaluation is “reduced prey populations in areas subject to intensive logging.” The project area has been subjected to intensive logging, but the biological evaluation also dismisses this factor, stating that there are plenty of well connected forest landscapes and that productive forest comprises 70 percent of the Rowan Sedimentary Hills and the Saginaw Limestone Ridges. However, this analysis does not appear to have taken into account existing and proposed impacts on high value winter deer habitat necessary for deer survival during heavy snow periods. The analysis also does not effectively demonstrate old growth connectivity.

The Draft EIS defines winter deer habitat as productive old growth. However, not all productive old growth is of equal value as winter deer habitat. Thus, we believe the Draft EIS analysis has inflated the effective amount of winter deer habitat in the project area. Furthermore, the Draft EIS maps show that most of the medium and high value deer winter habitat in the project area has

been harvested. We recommend that the Final EIS show an effects analysis for low, moderate, and high value winter deer habitat separately.

We recommend that any active wolf dens found in the project area be protected by a buffer as required by the TLMP standards and guidelines, and that such mitigation be discussed in the Final EIS. Habitat and geomorphic conditions can determine the size of this buffer, and the needed type of management activity in the den area. The FWS offers to help in this determination.

## SPECIFIC COMMENTS

The maps provided in the Draft EIS and the Errata are difficult to use for reviewing project effects. The alternative maps have a base layer of colors depicting forest wind disturbance probability rather than the productive forest strata maps usually used in timber sale EISs. Mapping the wind disturbance probability is helpful as the Draft EIS has incorporated this concept into project planning. However, alternative maps showing forest volume strata would facilitate a better understanding of forest conditions and habitat. We suggest that the Final EIS include such maps, as well as maps showing locations of high value winter deer and marten habitat. Elevation lines are also helpful and should remain on these maps.

Chapter 3, page 27. Though Figure 3-4 is meant to show volume strata, it is too dark and cluttered. It is difficult to determine the streams from roads or where the various forest volume stands are located. We suggest that the Final EIS include a larger map (the size of the Errata maps) showing the streams a different color than the roads, with stream names, VCU boundaries, and the volume classes. Such maps would simplify reviews of possible project impacts, and avoid reader confusion and misunderstanding.

Chapter 3, pages 17 through 24. The Draft EIS discusses the effects of the Alternatives according to the different sections of the project area, i.e., Cool Lake Units, Security Units, Rowan Mountain Units, Crane Creek Units, and the West Fork Kadake Units. However, the Draft EIS does not demonstrate old growth connectivity as intended. In each of these sections there is a statement that says at the “Stand Level” the proposed harvest units are connected to certain OGRs, beach fringe, and riparian buffers. It then refers to a map (Figure 3-4) showing wildlife movement patterns. This map shows connections between the proposed harvest units and designated old growth areas, rather than what is needed to demonstrate old growth connectivity. To show connectivity would require a map showing existing old growth connectivity that would be maintained between each of the OGRs and non-development land use designations. We recommend that such a map be included in the Final EIS. Also, whether the red lines on Figure 3-4 are actual wildlife use corridors or forested connections that the project planning team identified needs to be clarified in the Final EIS.

Chapter 3, page 24. Northern Goshawk. We suggest that the Final EIS describe mitigation measures contained in the TLMP standards and guidelines that would be implemented to protect confirmed or probable goshawk nest sites.

Chapter 3, page 25. Threatened, Endangered, or Sensitive Species. The Draft EIS refers to the project biological evaluation for more information about the northern goshawk, marten, Alexander Archipelago wolf, and other terrestrial mammals in the project area. Though the biological evaluation is contained in the Planning Record and is made available for public review, it is inconvenient to obtain for most of the reviewing public. We suggest that the Final EIS include the project biological evaluation or the species-specific information it contains.

Chapter 3, page 30. The Draft EIS states that forest policy is to avoid timber harvest and road construction on landslide-prone slopes. However, the units in the Rowan Mountain area appear to be in such an area. The Draft EIS also documents the area's high value to wildlife (Chapter 3, page 20). This is an unharvested south facing locale, yet it appears that nearly all other south facing slopes in the project area have been harvested. Harvest in this area would remove more such habitat and increase the probability of landslides and sediment loading of local streams. The road would increase human access. Though the Draft EIS states that new roads would be closed in this area to protect the wildlife, problems associated with this approach are addressed in detail above. Finally, the Draft EIS documents the Rowan Mountain area's use even during the years when deer populations were low, suggesting that this is one of the more important deer use areas. Due to these factors, we recommend that the Final EIS include an alternative in which all the Rowan Mountain units are either not harvested or are managed using select harvest; e.g., individual tree or small patch cuts, using helicopters.

Chapter 3, page 55. The Draft EIS states that all roads in the project area are designed and used solely for silvicultural uses and that it is unlikely that they will be used for other purposes. However, other sections of the Draft EIS state that Kuiu Island is used for many other consumptive and non-consumptive uses, i.e. Chapter 3, page 5. The Draft EIS (Chapter 3, page 44) states that outfitting and guide use is increasing in and around Kuiu Island, and that small hunting and fishing groups are typical. Larger educational and scenic touring groups are also known to use the island. We suggest that the Final EIS resolve this apparent contradiction.

Index. We suggest that the Final EIS contain an Index.

Appendix A, page 5, VI. Conclusion. This section explains the need for the project and timber demand. However, the Conclusion states: "This volume will contribute to meeting the average annual volume of 77 mmbf; if any less volume is harvested in the Crane Rowan Mountain Project Area, either the analysis of another area would need to be completed before scheduled or the volume of an ongoing analysis would need to increase." (Emphasis added.) The words "meeting" and "need" implies that the 77 mmbf contributing to the Annual Sale Quantity (ASQ) "assigned" to the Stikine Area is a target that must be met. The TLMP Standards and Guidelines for Timber states that the ASQ is not a target, but a ceiling. Furthermore, the word "will" implies that the decision for this project has already been made. We suggest the following replacement language in the Final EIS: "This volume would contribute to the average annual demand volume of 77 mmbf assigned to the Stikine Area."

We appreciate the opportunity to participate in the planning of the Crane and Rowan Mountain Timber Sales project. Please contact Carol Hale, U.S. Fish and Wildlife Service, 907-586-7240, when opportunities arise for her to participate in any future meetings or if you have any questions concerning the above comments.

Sincerely,



Doug L. Mutter

for Regional Environmental Officer - Alaska

Enclosures



File Code: 1950

Date: June 30, 1998

Doug Mutter  
USDI, Office of Environmental Policy and Compliance  
1689 C. Street, Room 119  
Anchorage, AK 99501-5126

Dear Mr. Mutter:

Thank you for your letter of April 1, 1998, and for your thorough review of the Draft Environmental Impact Statement for the Crane and Rowan Mountain Timber Sales. This letter and a copy of your letter dated March 30, 1998, will be printed in Appendix C of the Final EIS.

In your letter, you make numerous recommendations to include additional information and analysis in the FEIS. An important consideration in the preparation of this DEIS has been the reduction in paperwork as specified in 40 CFR 1500.4. In general, we have tried to make this DEIS as brief and concise as possible while providing enough site specific information to demonstrate a reasoned consideration of the environmental effects. We will add additional information to the FEIS where appropriate and necessary to disclose the impacts of the alternatives considered; however, much of the supporting information and technical analysis will remain in the planning file for this project. This information, in the form of specialist reports, biological assessments, watershed analysis reports, etc., is available at the Petersburg Ranger District Office.

The following replies are in the approximate order of the comments in your letter.

### *Cumulative effects*

The effects analysis in chapter 3 of the FEIS includes the cumulative effects of all past timber harvest as well as the Rowan Settlement and the Saginaw Timber Sale which are currently under contract but not yet logged. It is too speculative at this time to include detailed analysis of possible timber harvest on other areas of Kuiu as this is in the very preliminary stage of planning. Cumulative impacts to the island as a whole however, will be considered as part of the planning process for any future timber sales on Kuiu Island.

### *Natural disturbance ecology*

The intent of the disturbance ecology management strategy is to emulate natural disturbance patterns and ecological processes to the extent possible in a managed forest. We realize that it will not be possible to entirely accomplish this in the Crane and Rowan Mountain project area due to the amount of past even-aged management.



The IDT decided not to include single tree selection or small group selection harvest on this project as explained in the DEIS on page 2-10. The diameter limit harvest prescription is designed to emulate the structural characteristics of late stage multi-cohort and all-age stands. Much of the project area will be managed in the natural (old growth) condition including the large, medium and small old-growth reserves, beach and estuarine buffers, riparian buffers, oversteepened slopes, etc.

Most of unit 400-18 and much of unit 399-13 are wind generated stands in the understory reinitiation stage, even though they are on mostly north-facing slopes. Topography affects wind dynamics in these areas. Please refer to the unit cards in Appendix A of the FEIS for a description of the current condition of the natural stands.

Blowdown patches identified on Kuiu Island range in size from less than two acres to several hundred acres. The mean size is less than 50 acres. Although Nowacki and Kramer (1997) did not make a size recommendation for clearcut units, all clear cut patches in Alternatives 3 and 4 are 50 acres or less. (Refer to Table 2-1 on page 2-15 of the DEIS.) The average clearcut patch in Alternative 3 is 19.1 acres, and 17.5 acres in Alternative 4.

#### *Unit 400-8*

Unit 400-8 is not included in the preferred alternative (Alternative 4) or in Alternatives 1 and 5. This unit is included in Alternatives 2 and 3 only. In both these alternatives, a wildlife corridor remains between Security Creek and the top of the ridge.

#### *Old-growth habitat strategy*

We are planning a meeting in July with representatives from Alaska Department of Fish and Game, U. S. Fish and Wildlife Service, and Forest Service biologists to discuss location and function of the small old-growth reserves on Kuiu Island.

#### *Alexander Archipelago wolf and Sitka black tailed deer*

A summary of the Biological Evaluation discussing impacts to the Alexander Archipelago wolf is in the habitat conservation section of chapter 3 of the FEIS. A complete discussion of environmental effects on wolves, including available scientific literature, is located in the Biological Evaluation in the planning record for this project.

The deer model used is the Interagency Deer Model version 7.0.1, which is the most current model. It will be cited in the FEIS as you suggested.

The information concerning wolf populations trends on Kuiu Island is from an ADF&G annual publication entitled "Wolf: Federal Aid in Wildlife Restoration, Annual Performance Report Survey-Inventory Activities, 1 July 1996-30 June 1997", as well as observations by the members of the Kuiu IDT and local ADF&G personnel. This publication and the document The Alexander Archipelago Wolf: A Conservation Assessment (Person et.al. 1996) will be cited in the biological evaluation. The new information you provided on deer densities from Dave Person has been incorporated into the biological evaluation and is reflected in the FEIS.

The number of deer needed to sustain wolf populations and allow deer hunting to continue is 18 deer per square mile. The analysis conducted for the Forest Plan (Iverson 1997) indicates that current deer density in WAA 5012 is 27 deer per square mile and will be reduced to 18 deer per square mile in the year 2095 if the Forest Plan was fully implemented on Kuiu Island. An analysis of the deer density per square mile is available in the Subsistence Specialists Report and the Wildlife Specialist Report in the planning record.

The third finding in the biological evaluation has been clarified in response to your comment. An evaluation of wolf population and access management will be conducted for Kuiu Island in conjunction with FWS and ADF&G if excessive wolf mortality becomes a problem.

While some trapping does occur on Kuiu Island, it is not a major factor island-wide. Several outfitter/guides use Kuiu Island for black bear hunting. People may bring vehicles onto the island periodically, but we expect use to be low. Most outfitter/guides access the island from saltwater by boat. See page 3-44 of the DEIS.

Wolves are impacted by people using the roads, not the roads themselves. The road density thresholds developed from studies on Prince of Wales Island (Person et. al., 1996, 1997) should only be applied to islands with similar road use patterns. Unlike Prince of Wales Island, Kuiu Island has no permanent communities and is not connected to the ferry system. Dave Person, in a memo entitled "Analysis of Deer Harvest and Road Data" and addressed to Moira Ingle, Doug Larsen and Matt Kirchhoff of ADF&G, states: "The data shown are only for WAAs on Prince of Wales Island. The dynamics and relations that may exist on the other islands in the region may be different from POW because they do not have the human population and access to a ferry system, which can transfer automobiles."

The deer model indicates sufficient habitat to maintain the population above the critical level to maintain wolf populations as well as hunter demand for deer. A complete evaluation is available in the subsistence specialist report.

Any wolf dens found within the project area will be protected by a buffer as provided for in the Forest Plan.

Kuiu Island has been subjected to very little ATV use in the past, and we do not expect a significant increase in the future. Road closure procedures cannot exclude all ATV's. The traffic management strategy for roads constructed in this project is not to eliminate all ATV use in the short term, but to discourage it. Over time, vegetative closure, especially natural colonization by alder, will effectively eliminate ATV use. The Road Management Objectives Maintenance Strategy map in Appendix B of the DEIS shows roads that will be put into storage and obliterated. For these reasons, we do not believe that the wolf population on the north end of Kuiu Island is in danger of extirpation.

### *Specific comments*

We have revised the alternative maps in the FEIS to make them easier to use. We have also added a map to the FEIS showing the volume strata in relation to proposed harvest units as you requested. A map showing high value deer habitat will be added to the FEIS, and a martin habitat map is available in the planning record.

The animal use patterns shown on the map in Figure 3-4 of the DEIS have been changed to more clearly show connectivity of old-growth reserves. Beach fringe, riparian habitat areas, small old-growth reserves, and non-timber production LUDs connect medium and large old-growth reserves.

Mitigation measures to protect goshawk nest sites are contained in the Forest Plan standards and guidelines, and will not be repeated in the FEIS.

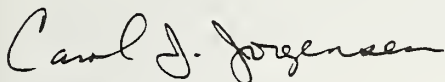
Landslide prone slopes exist in the Rowan Mountain area. However, all roads and harvest units avoid the most hazardous soils (i.e., MMHaz=4 soils types). This area is important deer habitat as stated in the DEIS; however, we believe we have successfully mitigated most adverse effects to wildlife habitat, especially in Alternatives 3 and 4. Alternative 1 includes no harvest or road construction in the Rowan Mountain area.

As stated in the DEIS on page 3-44, recreational use on Kuiu Island depends largely on saltwater access. There is very little recreational use of the roads primarily due to the lack of public transportation to the island and the absence of permanent communities on the island. We do not anticipate a significant increase in recreational use in the future.

The FEIS will contain an index as you requested, and include a summary of the biological evaluation.

Appendix A has been revised to avoid the implication of a predetermined target volume. It is available in the planning file for this project and is not included as an appendix in the FEIS.

Sincerely,



CAROL J. JORGENSEN  
Assistant Forest Supervisor



# STATE OF ALASKA

TONY KNOWLES, GOVERNOR

## OFFICE OF THE GOVERNOR

OFFICE OF MANAGEMENT AND BUDGET  
DIVISION OF GOVERNMENTAL COORDINATION

☐ SOUTHCENTRAL REGIONAL OFFICE  
3601 "C" STREET, SUITE 370  
ANCHORAGE, ALASKA 99503-5930  
PH: (907) 269-7470/FAX: (907) 561-6134

☒ CENTRAL OFFICE  
P.O. BOX 110030  
JUNEAU, ALASKA 99811-0030  
PH: (907) 465-3562/FAX: (907) 465-3075

☐ PIPELINE COORDINATOR'S OFFICE  
411 WEST 4TH AVENUE, SUITE 2C  
ANCHORAGE, ALASKA 99501-2343  
PH: (907) 271-4317/FAX: (907) 272-0690

April 15, 1998

Ms. Patty Grantham, District Ranger  
U.S. Forest Service, Petersburg Ranger District  
P.O. Box 309  
Petersburg, AK 99833

Dear Ms. Grantham:

SUBJECT: CRANE AND ROWAN MOUNTAIN TIMBER SALE  
STATE I.D. NO. AK 9802-02JJ  
FINAL CONSISTENCY FINDING

The Division of Governmental Coordination has coordinated the State's review of the U.S. Forest Service's consistency determination for the Crane and Rowan Mountain Timber Sale. The FS found the activity consistent, to the maximum extent practicable, with the Alaska Coastal Management Program (ACMP).

The location of the sale is north Kuiu Island, Alaska. The sale (all alternatives) proposes the harvest of between 17.8 and 24 MMBF of timber from approximately 711 to 1,056 acres. Between 7.9 and 9.01 miles of road would be built. The existing Rowan Bay log transfer facility would be used for transport of logs by barge.

The Forest Service has identified Alternative 4 as the preferred alternative for this project, and the ACMP review was restricted in scope to this alternative. This alternative proposes to harvest approximately 24 MMBF of timber from 1,056 acres, and to construct a total of 7.99 miles of specified and temporary roads.

This final consistency finding, developed under 6 AAC 50, applies to the federal consistency determination required for the project per 15 CFR 930 Subpart C. The following comments are offered pursuant to 6 AAC 50 of the ACMP. ACMP (FRPA) standards are cited where applicable.

RECEIVED

APR 20 1998

Tongass N.F.

### ACMP Consistency Finding:

The State has three broad areas of concern for coastal resources affected by federal timber harvest activities: fish and fish habitat; wildlife and wildlife habitat; and water quality. The State enforceable policies that address these concerns are found in the Alaska Forest Resources and Practices Act (FPRA) and its implementing regulations.

The State reviewed the proposed timber harvest activity to determine if state coastal resource concerns are adequately addressed and to determine if the State agrees that the activity is consistent, to the maximum extent practicable, with the enforceable policies of the ACMP. The State concurs with the FS determination of consistency based on the following:

#### Road Cards and Road Management Objectives

The road cards for this DEIS are some of the best that we have seen in terms of their format and the level of information that they provide. In particular, the Maintenance Narrative, Site Specific Design Criteria, and the Stream Crossings sections provide the level of detail that the state has long sought to be included in Forest Service timber sale EISs. We were especially pleased to see the site-specific stream crossing structure information. While we realize that the sizes and types of the proposed crossing structures are preliminary, and will ultimately depend on cost and other factors considered during final road layout, this type of information is extremely useful in that it provides an indication of the channel characteristics at the crossing sites, including stream width, gradient, incision depth, substrate, and the type of fish habitat present.

Like the Road cards, the Road Management Objectives (RMOs) and maintenance strategies used in this DEIS are the best that we have seen. They are straightforward, unambiguous, and clearly describe how the roads will be managed following completion of this timber sale. Most importantly, however, they are reasonably achievable and demonstrate that the proposed maintenance and closure methods can be accomplished consistent with the standards of 11 AAC 95.315 (road maintenance) and 11 AAC 95.320 (road closure).

We are able to agree with the FS's consistency determination based, in large part, on the level of information that was provided concerning road construction, maintenance and closure. In addition, the proposed full implementation of the TLMP process group standards and guidelines (RIP2, III, E) along all Class I, II, and III streams within the project area provides reasonable assurance that yarding will be carried out consistent with the standards of 11 AAC 95.360(a).

### Advisories:

We highly recommend that the Forest Service use the Crane Rowan road card format and RMO and maintenance strategy terminology (active, storm proof, and storage), and methods, as described on

pages 5 and 6 of Appendix B, as the standards for all future timber sale EISs on the Tongass. Doing so would greatly facilitate the state's review and determination of consistency for this aspect of proposed timber sale projects.

We also recommend that the FS fully describe the location and purpose for each small old growth reserve in future NEPA and ACMP reviews. This would greatly facilitate State reviews and allow for more substantive comments.

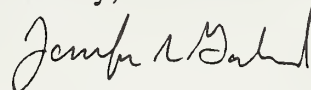
Comments offered pursuant to Section 319 of the Clean Water Act, NEPA, and the implementation of TLMP are attached.

Should cultural or paleontological resources be discovered as a result of this activity, we request that work which would disturb such resources be stopped, and that the State Historic Preservation Office be contacted immediately (269-8720).

This final consistency determination is a final administrative decision for purposes of Alaska Appellate Rules 601-612. Any appeal from this decision to the superior court must be made within 30 days of the date of this determination.

If you have any questions regarding this process, please contact me at 465-3177 or email [Jennifer\\_Garland@gov.state.ak.us](mailto:Jennifer_Garland@gov.state.ak.us).

Sincerely,



Jennifer R. Garland  
Project Review Coordinator

cc:

\*\* Kevin Hanley, DEC, Juneau  
\*\* Lana Shea Flanders, DFG, Juneau  
\*\* Bill Hanson, DFG, Juneau  
\*\* Jim Cariello, DFG, Petersburg  
\*\* Jim McAllister, DNR, Juneau  
Judith Bittner, DNR/SHPO, Anchorage  
\*\* Mark Jen, EPA, Anchorage  
\*\* Carol Hale, FWS, Juneau  
\*\* Steve Zimmerman, NMFS, Juneau  
Lonnie Anderson, Kake Coastal District  
Buck Lindekugel, SEACC, Juneau  
Tom Waldo, SCLDF, Juneau

\*\* = email

**NEPA and Clean Water Act Section 319 Comments:**Disturbance Ecology and Alternatives to Clearcutting

We are pleased to see that the Forest Service has developed alternatives for this project that limit the amount of clearcutting and attempt to mimic the natural disturbance regime within the project area. Specifically, under Alternatives 3 and 4, clearcutting comprises only 26 and 15 percent of the total harvest acreage, respectively. The balance of the acres proposed for harvesting under these alternatives is prescribed for diameter limit selective harvesting which, according to the DEIS (page 2-10), will retain approximately 50 percent of the original overstory canopy cover, and is intended to resemble the understory reinitiation stage of wind-generated partial disturbance. While this prescription appears to be somewhat excessive in terms of accurately mimicking natural disturbance processes, especially gap-phase succession, it is commendable that the Forest Service has attempted to design this sale to be compatible with the disturbance ecology of this portion of Kuiu Island. This is particularly so given the fact that the project area is located entirely within a Timber Production LUD. In addition to maintaining a moderate degree of structural diversity (multiple age and size classes) within the harvest units, this prescription should also better ensure slope stability and minimize impacts to hydrologic processes (runoff timing and yield) and water quality.

This project and the recently proposed Crystal Creek Timber Sale are among the first large timber sale projects on the Tongass to extensively consider and incorporate disturbance ecology principles. We are encouraged by this apparent trend and hope that it continues within and extends beyond the Stikine Area to the Ketchikan and Chatham Areas as well.

Watershed Analyses

The Security Creek and Dean Creek watershed analyses that we received as a supplement to the DEIS are both concise and comprehensive, and clearly indicate how they were used in determining the location and extent of timber harvesting and road construction, as well as the silvicultural prescriptions for the proposed harvest units. However, according to Figure 12 on page 29 of the Security Creek analysis, the northern lobe of the southeastern portion of Unit 400-12 occurs on very high mass movement index (MMI4) soils, though no mention is made of this in the analysis. Since the new Forest Plan specifically prohibits harvesting on MMI4 soils and has removed them from the suitable lands base, this portion of the unit will need to be deleted prior to the release of the Record of Decision for this sale.

**TLMP Implementation Comments:**

It appears that the small OGR is intended to provide connectivity between the Bay of Pillars (LUD 2), and North Kuiu via Rowan Creek travel corridor. However, the portion on the south side of Rowan Bay (which was not printed on the Alternative maps), is unlikely to provide much wildlife value. DFG recommends that the FS reexamine this old growth reserve in conjunction with the U.S.

Fish and Wildlife Service and DFG, to ensure that it is in the most suitable location.

# MEMORANDUM

State of Alaska

Department of Environmental Conservation

TO: Jennifer Garland  
Project Review Coordinator  
OMB - DGC

DATE: March 26, 1998

FILE NO: AK9802-02JJ

THRU:

TELEPHONE NO: 465-5364

FROM: Kevin J. Hanley <sup>KJH</sup>  
Environmental Specialist  
Division of Air and Water Quality

SUBJECT: Crane and Rowan Mountain  
Timber Sale DEIS

The Department of Environmental Conservation has reviewed the Draft Environmental Impact Statement (DEIS) for the U.S. Forest Service's proposed Crane and Rowan Mountain timber Sale on Kuiu Island. Specifically, this sale proposes to harvest between 17.8 and 24 MMBF of timber from approximately 711 to 1,056 acres, and to construct between 7.9 and 9.01 miles of road, depending on alternative. In addition, the existing permitted log transfer facility at Rowan Bay will be used to transfer all of the harvested timber volume directly to barges.

The Forest Service has identified Alternative 4 as the preferred alternative for this project. This alternative proposes to harvest approximately 24 MMBF of timber from 1,056 acres, and to construct a total of 7.99 miles of specified and temporary roads. We offer the following comments pursuant to 6 AAC 50 of the Alaska Coastal Management Program (ACMP) and Section 319 of the Clean Water Act (CWA). These comments collectively address ACMP, CWA Section 319, and NEPA concerns, with ACMP standards cited, where applicable.

## 1. Disturbance Ecology and Alternatives to Clearcutting

We are pleased to see that the Forest Service has developed alternatives for this project that limit the amount of clearcutting and attempt to mimic the natural disturbance regime within the project area. Specifically, under Alternatives 3 and 4, clearcutting comprises only 26 and 15 percent of the total harvest acreage, respectively. The balance of the acres proposed for harvesting under these alternatives is prescribed for diameter limit selective harvesting which, according to the DEIS (page 2-10), will retain approximately 50 percent of the original overstory canopy cover, and is intended to resemble the understory reinitiation stage of wind-generated partial disturbance. While this prescription appears to be somewhat excessive in terms of accurately mimicking natural disturbance processes, especially gap-phase succession, it is commendable that the Forest Service has attempted to design this sale to be compatible with the disturbance ecology of this portion of Kuiu Island. This is particularly so given the fact that the project area is located entirely within a Timber Production LUD. In addition to maintaining a moderate degree of structural diversity (multiple age and size classes) within the harvest units, this prescription should also better ensure slope stability and minimize impacts to hydrologic processes (runoff timing and yield) and water quality.

This project and the recently proposed Crystal Creek Timber Sale are among the first large timber sale projects on the Tongass to extensively consider and incorporate disturbance ecology principles.

We are encouraged by this apparent trend and hope that it continues within and extends beyond the Stikine Area to the Ketchikan and Chatham Areas as well.

## 2. Watershed Analyses

The Security Creek and Dean Creek watershed analyses that we received as a supplement to the DEIS are both concise and comprehensive, and clearly indicate how they were used in determining the location and extent of timber harvesting and road construction, as well as the silvicultural prescriptions for the proposed harvest units. However, according to Figure 12 on page 29 of the Security Creek analysis, the northern lobe of the southeastern portion of Unit 400-12 occurs on very high mass movement index (MMI4) soils, though no mention is made of this in the analysis. Since the new Forest Plan specifically prohibits harvesting on MMI4 soils and has removed them from the suitable lands base, this portion of the unit will need to be deleted prior to the release of the Record of Decision for this sale.

## 3. Road Cards and Road Management Objectives

The road cards for this DEIS are some of the best that we have seen in terms of their format and the level of information that they provide. In particular, the Maintenance Narrative, Site Specific Design Criteria, and the Stream Crossings sections provide the level of detail that the state has long sought to be included in Forest Service timber sale EISs. We were especially pleased to see the site-specific stream crossing structure information. While we realize that the sizes and types of the proposed crossing structures are preliminary, and will ultimately depend on cost and other factors considered during final road layout, this type of information is extremely useful in that it provides an indication of the channel characteristics at the crossing sites, including stream width, gradient, incision depth, substrate, and the type of fish habitat present.

Like the Road cards, the Road Management Objectives (RMOs) and maintenance strategies used in this DEIS are the best that we have seen. They are straightforward, unambiguous, and clearly describe how the roads will be managed following completion of this timber sale. Most importantly, however, they are reasonably achievable and demonstrate that the proposed maintenance and closure methods can be accomplished consistent with the standards of 11 AAC 95 315 (road maintenance) and 11 AAC 95.320 (road closure).

**We highly recommend that the Forest Service use the Crane Rowan road card format and RMO and maintenance strategy terminology (active, storm proof, and storage), and methods, as described on pages 5 and 6 of Appendix B, as the standards for all future timber sale EISs on the Tongass. Doing so would greatly facilitate the state's review and determination of consistency for this aspect of proposed timber sale projects.**

---

Pursuant to 6 AAC 50 of the Alaska Coastal Management Program and 11 AAC 95 (the Forest Practices Regulations), the department concurs with the Forest Service's consistency determination for this project. Our concurrence applies only to the water quality and fisheries aspects of this sale. We are able to agree with this determination based, in large part, on the level of information that was provided concerning road construction, maintenance and closure. In addition, the proposed full

implementation of the TLMP process group standards and guidelines (RIP2, III, E) along all Class I, II, and III streams within the project area provides reasonable assurance that yarding will be carried out consistent with the standards of 11 AAC 95.360(a).

We appreciate the opportunity to comment.

cc: Jim Ferguson, ADEC  
Deena Henkins, ADEC  
Jim Cariello, ADF&G  
Bill Hanson, ADF&G  
Tom Paul, ADF&G  
Carol Hale, USFWS  
Ralph Thompson, USCOE  
Bill Ryan, USEPA  
Everett Kissinger, USFS  
Patty Grantham, USFS  
Brad Powell, USFS

File Code: 1950

Date: June 30, 1998

Jennifer R. Garland  
Division of Governmental Coordination  
P.O. Box 110010  
Juneau, AK 99811-0030

Dear Ms. Garland:

Thank you for your ACMP review and comments on the Draft Environmental Impact Statement for the Crane and Rowan Mountain Timber Sales. This letter and a copy of your letter dated April 1, 1998, will be printed in Appendix C of the Final EIS. The following replies are in the same order as your comments and the comments you included from ADEC.

*Road cards and road management objectives*

We are pleased that you find the information in the road cards and the road management objectives "Some of the best that we have seen." We will try to maintain this level of information in future timber sale NEPA documents.

*Disturbance ecology and alternatives to clearcutting*

Scientific studies on the ecology of forest disturbance from wind are continuing, and are being expanded to other areas of the Tongass. As we learn more about the role of disturbance in forest succession, it is our intention to design forest management practices to emulate these natural processes on both the stand level and on the landscape level. We believe these practices will be less disruptive to ecosystems and wildlife habitats. If this proves true, these management practices would likely be common throughout the Tongass.

*Watershed analysis*

The area within Unit 400-12, shown as soil hazard class MMHaz=4 (Figure 12 in the Security Creek Watershed Analysis), was changed to MMHaz=3 as a result of on-site field investigations. This change had not yet been made in our GIS database at the time we did the watershed analysis. This has now been corrected in the GIS database.



*TLMP implementation comments*

We are planning a meeting with representatives from Alaska Department of Fish and Game, U. S. Fish and Wildlife Service, and Forest Service biologists to discuss the location and function of all the small old growth reserves on Kuiu Island. We anticipate this meeting will take place in July.

*Advisories*

We are in the process of standardizing the road card format and maintenance strategy methods throughout the Tongass. We appreciate that it would help you when you review future timber sale EISs to have similar information presented in a similar format.

We have added the information you requested about the location and purpose of small old growth reserves to Chapter 3 of the FEIS.

Should cultural or paleontological resources be discovered as a result of this activity, all work that could disturb these resources will be stopped and the State Historic Preservation Office will be contacted immediately.

We appreciate the State's review of the Crane and Rowan Mountain Timber Sale DEIS and your concurrence with our ACMP consistency determination.

Sincerely,



CAROL J. JORGENSEN  
Assistant Forest Supervisor

cc:  
Kevin J. Hanley, ADEC

*P.S. It was really nice to meet you, and I look forward to having more time to talk.*

MAR 2 1991

JOHN D. SEBASTIAN  
POINT BAKER, AK 99927  
3.22.98

### TONGASS RIVER

#### Comments on Crane & Rowan

Why don't you guys let Kuiu Alone for A while. After 20 years of industrial clearcut logging on N. Kuiu, it time to clean up the old mess, not create New ones. I support the no-action Alternative.

The USFS had no public hearings in Kake, The town most Adversely Affected, by Crane & Rowan. This seems like A rather thick headed oversight on The part of The USFS Sitkeine district.

The USFS maintains there will be no restriction on subsistence. Yet the cumulative cumulative impacts alone of past logging add up to A serious restriction already. Now you add more clearcuts on top of that and want to pretend its A-OK.

All the Alternatives, even the no action Alt, already have significant restrictions to subsistence.

I would say that it is time for The USFS to recognize that Kuiu is regarded as A special place by many persons, as A cultural homeland by the Native people of Kake, and A place<sup>of</sup> wilderness and spiritual importance to all.

The Forest Service continues to ignore what Kuiu means to many peoples lives and regard the whole island a timber ware house for exploitation alone.

You had A chance in TLMP to redesignate Kuiu IS, and failed to listen to public comment, insisted you follow 'Fore plan' and the Timber-first politics. Bad move. Clean up your old clearcut mess before making new ones.



File Code: 1950

Date: June 30, 1998

Joseph D. Sebastian  
P.O. Box 129  
Point Baker, AK 99927

Dear Mr. Sebastian:

Thank you for your comments on the Draft Environmental Impact Statement for the Crane and Rowan Mountain Timber Sales. Your preference for the no-action alternative is noted. This letter and a copy of your letter dated March 22, 1998, will be printed in Appendix C of the Final EIS. The following replies are in the same order as the comments in your letter.

Formal subsistence hearings according to Section 810 of ANILCA were not conducted in Kake because our analysis did not show that there would be a possibility of a significant restriction to subsistence. However, three meetings were held in Kake following the AWRTA v. Morrison settlement agreement to discuss management of Kuiu Island including the Crane and Rowan Mountain Timber Sales. These meetings were held May 21, June 11, and August 2, 1996. In addition, an open house was held in Kake in November, 1997. Furthermore, the Interdisciplinary Team members recently met with the Organized Village of Kake Council to discuss this project and its impacts to the subsistence resource.

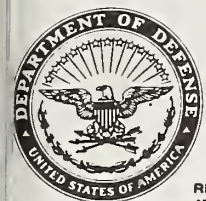
The analysis of deer habitat capability and hunter demand shows that there will not be a restriction on subsistence in Wildlife Analysis Areas 5012 or 5013, which cover all of the Crane and Rowan Mountain project area. The FEIS will include more information on the projected effects on subsistence resources.

The Forest Service does recognize that many people regard Kuiu Island as a special place. The whole island is not available for timber harvest. The concerns of residents of Point Baker, Port Protection and other Southeast Alaska communities were considered in the TLMP draft EIS and ANILCA 810 hearings. Information received at those meetings was used to assist the Regional Forester in deciding to change much of South Kuiu Island from the timber development to semi-primitive recreation allocation which does not permit timber harvest. About one-third of the island is available for timber harvest, while approximately two-thirds is designated as wilderness or other non-developmental land use allocations. The graph on page 1-5 of the DEIS shows the percent of each land use designation on Kuiu Island.

Sincerely,

CAROL J. JORGENSEN  
Assistant Forest Supervisor





DEPARTMENT OF THE ARMY  
U.S. ARMY ENGINEER DISTRICT, ALASKA  
P.O. BOX 898  
ANCHORAGE, ALASKA 99506-0898

REPLY TO  
ATTENTION OF:

Regulatory Branch  
East Section

MARCH 25 1998

RECEIVED  
MAR 25 1998  
FOREST SERVICE

Mr. Everett Kissinger, Team Leader  
U.S. Forest Service  
Tongass National Forest  
Post Office Box 1328  
Petersburg, Alaska 99833

Dear Mr. Kissinger:

These comments are submitted in response to the December 1997, Draft Environmental Impact Statement (DEIS), for the Crane and Rowan Mountain Timber Sale, on Kuiu Island, Alaska. Our comments are presented as a regulatory agency, as opposed to a commenting agency, and the requirements detailed below are requirements of federal law and/or regulation.

- Corps of Engineers (Corps) Jurisdiction: Based on information provided in the DEIS, we concur that wetlands and waters which are under the Corps' regulatory jurisdiction occur within the project area. Our regulatory authorities that relate to timber harvest operations are based on two laws: Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) prohibits the obstruction or alteration of navigable waters of the United States (U.S.), and Section 404 of the Clean Water Act (33 USC 1344) prohibits the discharge of dredged or fill material into waters of the U.S., including wetlands, without a Department of the Army (DA) permit.
- Wetland Impacts: Wetlands are defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include "muskegs", forested swamps, marshes, bogs, and similar areas. The DEIS states in Table 3-17 that from 1.8 to 2.2 miles of new road would be constructed in wetlands under the action alternatives, which, based on a 24-foot road prism, would affect between approximately 5.2 and 6.4 acres of wetlands.
- Clean Water Act 404(f) Exemptions: Section 404(f)(1)(a) of the Clean Water Act states that normal silviculture activities for the production of forest products, which are part of an established, ongoing operation, are not subject to regulation under Section 404 of the Clean Water Act. However, in order to qualify, the activity must not result in a conversion of an area of waters of the U.S., (including wetlands) to a use to which it was not previously subject, whereby the flow or circulation of waters of the U.S. may be impaired or the reach of such waters reduced.

In addition, section 404(f)(1)(e) states that the construction or maintenance of forest roads for silviculture activities is exempt from regulation under Section 404 of the Clean Water Act, ***provided the roads are constructed and maintained in accordance with Best Management Practices*** (BMPs) listed at 33 CFR 323.4(a)(6) to assure that flow and circulation patterns and chemical and biological characteristics of waters of the U.S. are not impaired, that the reach of the waters of the U.S. is not reduced, and that any adverse effect on the aquatic environment is otherwise minimized. A copy of the mandatory BMPs is enclosed with this letter.

In order to qualify for the exemption, forest roads must be used for the sole purpose of silvicultural activities. Roads meeting one or more of the following criteria and meeting the BMPs will generally be considered exempt: a) roads that are not connected to a community road system or a ferry system (e.g., King George Timber Sale); b) roads built in isolated locations, with no or low population (e.g., Upper Carrol and King George Timber Sales); c) roads that otherwise have low anticipated non-silvicultural use substantiated by qualitative descriptions and/or data from similar projects and areas (e.g., traffic less than that associated with the silvicultural operation provided the maintenance level of the road is not increased); d) roads prescribed to be closed by a road order under 36 CFR 261, or by blocking to prevent travel by cars and trucks (e.g., South Lindenberg Timber Sale); and e) roads that are not connected to an arterial road system. Roads not meeting any of these criteria will usually require DA authorization.

- Wetland Mapping: For Corps-regulated activities, the standard for delineation of wetlands is the Corps of Engineers, Wetland Delineation Manual (1987), including any supplemental guidance or subsequent revisions. The Corps' policy is to verify all preliminary jurisdictional determinations or jurisdictional determinations done by anyone other than the Corps, to assure the work is consistent with the 1987 Wetland Delineation Manual (WDM). Valid sources of information, such as the NWI maps, the Tongass National Forest Resource Inventory, plant association data, or the Classification and Delineation of Wetlands Using Soils and Vegetation Data, Tongass National Forest (DeMeo, et.al. 1989), are suitable for supporting one or more wetlands criteria (soils, vegetation, hydrology) at the start of the NEPA process. The level of information provided to the Corps for the King George Timber Sale (December 1996) was a good example that met Corps expectations for wetland mapping for exempt activities.

Page 3-54 of the DEIS states "Approximately 29 percent of the project area is classified as wetland as defined by the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (USCOE, 1987)", but does not provide any basis for the statement. Any jurisdictional determinations (JD) or preliminary jurisdictional determinations (PJD) should, at a minimum, include a written description of the sources used, any mapping products generated, and a summary of the JD at particular sites.

Clean Water Act Compliance: Unit Plan 399-13, Appendix B, indicates that 800' of a linear muskeg will be avoided during the construction of specified road 46251. The Site Specific Design Criteria Road 46251 states "the first 1300' of the new construction past the managed stand crosses along the upper edge of a soil type mapped as muskeg/forested mosaic". The 12/12/97 Crane/Rowan Mountain Project Area Showing Wetland Class Delineations Map (wetland map) does not show the muskeg. Please clarify.

Unit Plan 400-8 states "a temporary spur will run through the upper portion of the unit and continue on into 400-9". The wetland map shows this road passing through a muskeg/forested mosaic but there is no discussion of this in the DEIS.

We have reviewed the proposed specified and temporary roads in terms of the Clean Water Act BMPs and are unable to concur, based on the information provided in the DEIS, that your project avoids and minimizes road impacts to wetlands to the maximum extent practicable. In this regard, additional wetland mapping information is required. We would appreciate receiving wetland mapping prepared in accordance with the 1987 wetland delineation manual for our verification. Alternatively, supplemental supporting information, such as field data sheets including sampling points, ground and aerial photography, wetland identification using the DeMeo/Loggy wetland classification method, soil mapping, and/or any other valid sources should be provided. If you are unable to provide this information, we will prepare a final wetland delineation for your project, within the constraints of our resource allocations. It should be understood that an onsite inspection by this office may be required prior to our making the final wetland delineation.

In addition we would appreciate documentation of measures to avoid impacts to waters of the U.S., including wetlands, especially with regard to the roads in VCU's 399 and 400.

- Log Transfer Facilities (LTF): Page 3-64 of the DEIS indicates that one former LTF (Rowan Bay, DA permit O-750228, Chatham Strait 60) has been identified to serve the project. This permit was modified October 7, 1997 to authorize the replacement of an existing equipment ramp bulkhead with a closed cell, circular, sheet pile bulkhead.

Corps authorization is required under all alternatives for the discharge of dredged or fill material below the high tide line or in wetlands, and for the construction of structures in navigable waters. Any other work, not currently permitted or any modification to permitted work, proposed in waters of the U.S., including wetlands, such as floating walkways, logging camps, outfalls, intakes, captive barges, log rafting areas, sort yards, etc. will require DA authorization. Wetland mapping prepared in accordance with the 1987 WDM is required for areas impacted by project components requiring DA authorization, (e.g., land-based camps, sort yards, LTF access roads, trail relocation under Alternative F, etc.). In addition, authorization from the EPA would also be required for the transfer of logs into marine waters under National Pollutant Discharge Elimination System Section 402 permit requirements.

- DA permit evaluation: Impacts to waters of the U.S. should be a major consideration during your review of alternatives with regard to both meeting the Federal BMPs, and for those project components which would require individual Section 10 of the Rivers and Harbors Act of 1899 or Section 404 of the Clean Water Act authorization. For wetland development proposals requiring Corps authorization, Corps permits are available only for projects which clearly demonstrate compliance with the Clean Water Act Section 404(b)(1) guidelines, which state that no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, as long as the alternative does not have other significant adverse environmental consequences. In those cases where a non water-dependent activity associated with a discharge is proposed for a "special aquatic site", such as wetlands, practicable alternatives are presumed to exist unless clearly demonstrated otherwise. An alternative is considered practicable if it is available and capable of being accomplished after taking into consideration costs, existing technology and logistics in light of overall project purpose.

We appreciate the opportunity to review this DEIS, and look forward to continued coordination for this and future timber sales. We are available for further discussion or clarification of our comments, as necessary. Please contact me at the letterhead address, by telephone at (907) 753-2720 or toll free in Alaska at (800) 478-2712 if you have any questions concerning our requirements.

Sincerely,

*Michael E. Holley*  
for Jeffrey K. Towner  
Chief, East Section

File Code: 1950

Date: June 30, 1998

Jeffery K. Towner  
Department of the Army  
U.S. Army Engineer District, Alaska  
P.O. Box 898  
Anchorage, AK 99506-0898

Dear Mr. Towner:

Thank you for your comments on the Draft Environmental Impact Statement for the Crane and Rowan Mountain Timber Sales. This letter and a copy of your letter dated March 25, 1998, will be printed in Appendix C of the Final EIS. The following replies are in the same order as the comments in your letter.

***Clean Water Act 404(f) Exemptions.***

All roads in the Crane and Rowan Mountain project area are used for the sole purpose of silvicultural activities. These roads are not connected to any community or ferry system. All proposed new roads will be closed after timber harvest is complete (Please see the DEIS, page 3-55). Therefore, these roads are not subject to regulation under section 404 of the Clean Water Act.

***Wetland mapping.***

The basis for the statement "approximately 29 percent of the project area is classified as wetland as defined by the Federal Manual for Identifying and Delineating Jurisdictional Wetlands" (page 3-54 of the DEIS), is the Wetland Class Delineation Map which we sent to you on 12/12/97. Our definition of wetlands is "wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." This is the same definition used in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands.

***Clean Water Act compliance.***

The Wetland Class Delineation Map shows the muskeg/forested wetland mosaic that Road 46251 crosses as map symbol 'MFM'.

With regard to Unit 400-8, the FEIS will include a discussion of the temporary spur road that runs through a muskeg/forested mosaic soil type and this unit.



The Wetland Class Delineation Map sent to you on 12/12/97 was prepared in accordance with the 1987 wetland delineation manual. This was produced using our GIS data base and the DeMeo/Loggy wetland classification method based on soil and vegetation parameters. It was field verified during the planning process, particularly in the vicinity of proposed roads. (Please see the site specific design criteria in the road management objectives, Appendix B of the DEIS.) This map is similar to the map for the King George Timber Sale area, which your agency has used as an example of an adequate wetland delineation map for exempt activities.

Specific measures to avoid locating roads in wetland areas are also documented in the site specific design criteria for each road segment, located in Appendix B of the DEIS.

*Log transfer facilities (LTF).*

We are aware of the requirements for project authorization from both the Corps and EPA.

*DA permit evaluation.*

Impacts to waters of the U.S. were a major consideration in the design of alternatives for this timber sale. Please see Watershed Effects, pages 3-29 through 3-38 of the DEIS. All BMPs listed in Forest Service Handbook 2509.22, R10 Amendment No. 2509.22-96-1 apply to all alternatives.

Sincerely,



CAROL J. JORGENSEN  
Assistant Forest Supervisor



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10  
1200 Sixth Avenue  
Seattle, Washington 98101

April 7, 1998

Reply To  
Attn Of: ECO-088

Ref: 97-053-AFS

Everett Kissinger  
Tongass National Forest  
P.O. Box 309  
Petersburg, Alaska 99833

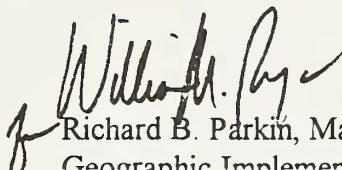
Dear Mr. Kissinger:

The U.S. Environmental Protection Agency (EPA) has received the draft Environmental Impact Statement (draft EIS) for the **Crane and Rowan Mountain Timber Sales** for review in accordance with our responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act.

EPA Region 10 has used a screening tool to conduct a limited review of the draft EIS and, based upon the screen, we do not foresee having any environmental objections to the proposed project. Therefore, we will not be conducting a detailed review of the draft EIS.

Should you have any questions, please contact Bill Ryan of my staff at (206) 553-8561.

Sincerely,

  
Richard B. Parkin, Manager  
Geographic Implementation Unit

cc: Kevin Hanley, ADEC  
Ralph Thompson, ACOE-Juneau

APR 14 1998  
Tongass N.F.



File Code: 1950

Date: June 30, 1998

Richard B. Parkin  
U. S. Environmental Protection Agency  
1200 Sixth Avenue  
Seattle, WA 98101

Dear Mr. Parkin:

Thank you for your review of the Draft Environmental Impact Statement for the Crane and Rowan Mountain Timber Sales. We are pleased that you do not have any environmental objections to this project.

Sincerely,

CAROL J. JORGENSEN  
Assistant Forest Supervisor





**EARTHJUSTICE**  
**SIERRA CLUB LEGAL**  
**DEFENSE FUND, INC.**

*The Law Firm for the Environmental Movement*

Sunrise, Mt. McKinley

Ansel Adams

325 4th Street Juneau, Alaska 99801

(907) 586-2751 FAX (907) 463-5891

March 30, 1998

Everett Kissinger  
Team Leader  
USDA Forest Service  
PO Box 1328  
Petersburg, AK 99833

**Received**  
**APR 3 1998**  
**Tongass N.F.**

Re: Crane and Rowan Mountain Draft EIS.

Dear Mr. Kissinger:

Earthjustice Legal Defense Fund submits these comments on the Crane and Rowan Mountain Draft EIS on behalf of its client, Organized Village of Kake (OVK). OVK is the federally recognized Tribal government for over 600 Native residents of Kake. 60 Fed. Reg. 9250, 9254-55 (Thursday, Feb. 16, 1995). This comment letter supplements any comments submitted directly by OVK.

The most fundamental defect in the Draft EIS is the finding that the logging will not significantly restrict subsistence uses. OVK was one of the plaintiffs in Alaska Wilderness Recreation and Tourism Association, et al. v. Morrison, et al. The consent decree in that case enjoined the units analyzed in the Crane-Rowan EIS, pending the supplemental EIS, for one reason: this area has great importance for subsistence uses by residents of Kake. The original North and East Kuiu EIS, which the Crane-Rowan EIS supplements, found that the cumulative impacts of past, present and reasonably foreseeable future logging would cause a significant restriction to subsistence uses. It is disingenuous for the Forest Service to assert now that the proposed logging will not significantly restrict subsistence uses, after finding a significant restriction in the original EIS, and after agreeing in the consent decree to enjoin these units to protect subsistence uses.



The analysis of subsistence uses in the Crane and Rowan Mountain Draft EIS is fatally deficient and cannot support any action alternative. It is based on several false and unsupported statements.

First, it states that East Kuiu, and not North Kuiu, was the basis for the significant restriction finding in the original North and East Kuiu EIS. DEIS ch. 1, p. 1. This is false and unsupported. The subsistence analysis in the North and East Kuiu drew no distinction between the two geographic areas in the project. To the contrary, the EIS found significant restrictions for all the alternatives, including Alternative 2, which would have allowed logging on North Kuiu but not East Kuiu. N&E Kuiu FEIS ch. 3, p. 110, Table 3-44; id. ch. 2, p. 13; N&E Kuiu ROD at 32.

In assessing the potential restrictions to subsistence, the Forest Service must consider not only the impacts of the immediately proposed sales, but also all past, present and reasonably foreseeable future actions that may restrict subsistence uses. N&E Kuiu FEIS ch. 3, pp. 118-19. The past, present and reasonably foreseeable future logging in the Kake subsistence use area is nearly the same now as it was at the time of the original EIS. In the original EIS, the Forest Service deer model showed that about 81% of the original deer habitat in the area would remain after implementation of the project, N&E Kuiu FEIS ch. 3, p. 110, while the new DEIS finds that habitat will be reduced to 80% of the original, without considering future sales. Crane-Rowan DEIS ch. 3, p. 12, Table 3-3. Taking into account future sales authorized by the Tongass Land Management Plan, future habitat could be reduced to as low as 55% of the original. Id. ch. 3, p. 12. The logging on East Kuiu is still proposed on agency timber sale schedules, which would exacerbate the restrictions resulting from the Crane-Rowan project. Thus, there is no basis for changing the conclusion of the original EIS, that the project will cause a significant restriction to subsistence uses of deer.

Second, the Crane-Rowan DEIS falsely asserts that "[t]he area is not an extensively used subsistence harvest area." Crane-Rowan DEIS ch. 3, p. 60. This statement is not only untrue, but again contradicts the original EIS. The North and East Kuiu FEIS correctly stated:

Traditionally, the Kupreanof and Kuiu Islands area has been an important deer harvest area. . . .

Historically, important use areas for many of the communities hunting for deer include Security, Saginaw, and Kadake Bays; Rowan Bay, Bay of Pillars, and the mouth of Port Camden to the southern coast of Port Beauclerc.

N&E Kuiu FEIS ch. 3, p. 92. The alternatives in the Crane-Rowan DEIS, including the proposed and preferred alternatives, include logging in Security Bay, Saginaw Bay, Kadake Bay, Rowan Bay, and Port Camden, all of which were identified in the quote above from the original EIS as historically important areas.

The Kake deer hunting map included in Appendix B of the original EIS confirms this fact. It shows subsistence deer hunting along nearly the entire coast of North Kuiu, with less use in East Kuiu. N&E Kuiu FEIS Vol. III, App. B at B-1.

The importance of North Kuiu for subsistence is also confirmed by the Alaska Department of Fish and Game. The Department has prepared the most complete and authoritative contemporary report on subsistence uses by residents of Kake. See A. Firman & R. Bosworth, Harvest and Use of Fish and Wildlife by Residents of Kake, Alaska, ADF&G Div. of Subsistence Technical Paper No. 145 (Feb. 1990). The report was prepared in cooperation with the community and the Forest Service, and is based on a literature search, household surveys, and interviews with long-term residents with experience and knowledge. This report is not cited in the DEIS, and OVK hereby incorporates it by reference. Because of its bulk (164 pages), we are not enclosing a copy. You already have many copies of it, as we have submitted the report to the Forest Service before. However, if you cannot locate a copy of the report, please contact me, and I will provide you with another one. I understand they are still available from the Department of Fish and Game as well.

Residents of Kake have also testified in litigation as to the importance of North Kuiu to subsistence uses in the village. See, e.g., Declaration of Henrich Kadake (attached).

In light of the well-documented and previously admitted extensive use of North Kuiu by residents of Kake for subsistence, it is perplexing why the Forest Service asserts in the DEIS that the area is not heavily used. The statement is completely

unexplained. However, it is possible that the statement is based on one of two frequently asserted misunderstandings.

First, all of Kuiu Island was closed to deer hunting from 1975 until 1992, due to low deer populations. See N&E Kuiu FEIS ch. 3, pp. 92, 109; Crane-Rowan DEIS ch. 3, p. 9. This extended closure skewed historic use patterns. Even now that the season has reopened, subsistence use of Kuiu Island has not rebounded to its historic levels because the bag limit for deer on Kuiu is much lower than for Admiralty and Baranof Islands. However, hunting on these islands places an enormous burden on residents of Kake because of the distance of travel and the danger of crossing the open waters of Frederick Sound. See Declaration of Henrich Kadake (attached). Residents of Kake will return to their traditional hunting areas on Kuiu Island as deer numbers recover. One cannot conclude on the basis of data after the early 1970's that the area is not important for subsistence hunting of deer. This fact was confirmed by the Forest Service itself, when it found a significant restriction to subsistence uses in the original EIS, even though the entire project area had been closed to deer hunting for an extended time.

Second, the Forest Service has on some occasions in the past claimed that restrictions to subsistence were minimized by not logging in the beach fringe, where most of the hunting occurs. Placing logging units outside the beach fringe will not protect subsistence hunting. Deer need the entire range of interior and beach habitat to survive, not just the thin strip along the beach where most of the hunting occurs. One peer reviewed, published study of radio collared deer concludes:

Management commonly recommends retention of narrow strips of beach-fringe timber as critical winter habitat. The value of this management action is questionable because only a small proportion of the deer population uses beach fringe in most winters, and for deer that do, the ability to make elevational moves may be constrained by snow in the clear-cut. Deer population losses may be reduced by reserving large blocks of old-growth habitat that maximize opportunities for deer to expand their winter range elevationally during mild winters or open snow conditions within a winter.

J. Schoen & M. Kirchhoff, Seasonal Distribution and Home-Range Patterns of Sitka Black-Tailed Deer on Admiralty Island,

Southeast Alaska, J. Wildl. Manage. 49(1):96-103 (1985); see also, J. Schoen & M. Kirchhoff, Seasonal Habitat Use by Sitka Black-Tailed Deer on Admiralty Island, Alaska, J. Wildl. Manage. 54(3):371-78 (1990) (copies attached).

The DEIS also asserts, again without explanation, that habitat would meet expected demand for deer throughout the rotation. Crane-Rowan DEIS ch. 3, p. 60. Since the basis for this statement is not provided, one can only speculate how the agency arrived at this conclusion. However, if it is based on data gathered since the deer population crash of the early 1970's, then it is highly misleading. As discussed above, deer hunting on Kuiu Island has been much below historical levels since that time due to an historically anomalous population event.

More fundamentally, however, the statement misses an important point. Even if deer numbers would be sufficient to meet demand, however demand is calculated, that fact would not prevent significant restrictions to subsistence uses. The decreased deer population densities caused by logging will require hunters to spend more time in the woods searching for scarcer numbers of deer, even if there are theoretically enough deer to meet demand. The need to expend more time and greater hunter effort is a restriction to subsistence uses.

Finally, the DEIS completely overlooks one of the most important ways in which the proposed timber sales will restrict subsistence uses: the loss of the spiritual and cultural value of participating in traditional subsistence harvests in the old growth forests used by the ancestors of the Tlingit residents of Kake for countless generations. Logging and building roads in these sacred places permanently and irreparably degrades an important cultural experience, even if there would be enough deer to meet demand. The courts have recognized that section 810 of ANILCA protects this value. Native Village of Quinhagak v. United States, 35 F.3d 388, 394 (9th Cir. 1994) (citing 16 U.S.C. § 3111(1)); Alaska Wilderness Recreation & Tourism Ass'n v. Morrison, 67 F.3d 723, 731 (9th Cir. 1995) (citing Quinhagak).

In short, the proposed finding in the DEIS that the timber sales would not restrict subsistence uses is arbitrary and capricious. The Forest Service must select the no action alternative.

Sincerely,

A handwritten signature in dark ink, appearing to read "Thomas S. Waldo", with a long horizontal flourish extending to the right.

Thomas S. Waldo

enclosures



File Code: 1950

Date: June 30, 1998

Thomas S. Waldo  
Earthjustice Legal Defense Fund  
325 4th Street  
Juneau, AK 99801

Dear Mr. Waldo:

Thank you for your comments on the Draft Environmental Impact Statement for the Crane and Rowan Mountain Timber Sales. In response to your letter, we have revised the subsistence section in the Final FEIS. This letter and a copy of your letter dated March 30, 1998, will be printed in Appendix C of the Final FEIS. The following replies are in the same order as the comments in your letter.

The differences between the North and East Kuiu FEIS and the Crane and Rowan Mountain Timber Sales DEIS are twofold. First, the project areas differ. The Crane and Rowan Mountain project area covers only the north side of Kuiu Island, not the north and east sides as in North and East Kuiu FEIS. Second, the two EISs use different management standards and guidelines. The Crane and Rowan Mountain DEIS uses standards and guidelines provided in the 1997 Forest Plan. The North and East Kuiu FEIS uses standards and guidelines from the 1979 Forest Plan. The 1997 Forest Plan standards and guidelines include:

- the creation of an old-growth habitat reserve system;
- increased size and number of riparian buffers;
- beach fringe buffers expanded to 1000 feet;
- new wild, scenic, and recreation river designations (Fall Dog Creek and Kadake Creek within the Crane and Rowan Mountain project area); and,
- a new deer model (version 7.0.1) that better represents what we know about deer and their habitat requirements.

The AWRTA settlement agreement states on page two and three that some of the units in the Crane and Rowan Mountain sale area "will remain subject to injunction pending compliance with NEPA and ANILCA section 810." The Crane and Rowan Mountain Timber Sales FEIS is the instrument to meet these requirements.

The North and East Kuiu FEIS did find a significant possibility of a significant restriction on subsistence deer use, while the Crane and Rowan Mountain analysis does not. A more detailed description of subsistence uses within the project area and the potential for impacts to subsistence use of deer is contained in the planning record as the subsistence specialist report. Additionally, in response to your comments, we are including much of this information in the FEIS for this project.



Deer subsistence analysis is conducted on each Wildlife Analysis Area (WAA) within the project area. The North and East Kuiu FEIS found that a restriction to subsistence use would occur in WAAs 5014 and 5018. However, the Crane and Rowan project area does not include either of these WAAs. (Please see North and East Kuiu FEIS pages 3-105 through 3-108.)

The North and East Kuiu FEIS analysis showed a restriction to subsistence for Alternative 2 because this alternative included harvest in WAA 5018. In this WAA, even the no-action alternative shows a significant restriction because hunter demand exceeds habitat capability. The Crane and Rowan Mountain project does not include harvest in WAA 5018.

The effects analysis in the FEIS includes the cumulative effects of all past timber harvest as well as the Rowan Settlement and the Saginaw Timber Sale which are currently under contract but not yet logged. It is too speculative at this time to include detailed analysis of possible timber harvest on East Kuiu as this is in the very preliminary stage of planning. Cumulative impacts to the island as a whole however, will be considered as part of the planning process for any future timber sales on Kuiu Island.

We recognize that Kuiu Island is historically important for subsistence users from Kake. Since deer populations have been low since 1972, Kuiu Island has not been heavily used for subsistence deer hunting. People that traditionally hunted north Kuiu Island have gone elsewhere to hunt deer, such as to Admiralty Island. We expect subsistence deer hunting on north Kuiu Island to increase as deer populations rebound. This has been clarified in the FEIS.

We recognize that there are many habitats that are important deer range, not just the beach fringe where most hunting occurs. The Forest Plan's standards and guidelines provide a range of deer habitats by creating the Old Growth Reserves, riparian buffers, and extending the beach fringe to 1000 feet.

The basis for the subsistence determination is an analysis that compares the habitat capability (supply) to the hunter demand for deer (demand). The amount of deer the habitat is capable of producing is estimated using the interagency deer model (version 7.0.1). Subsistence demand for deer is based on the Strategic Plan for Management of Deer in Southeast Alaska, 1991-1995, Population Objectives produced by the Alaska Department of Fish and Game, Division of Wildlife Conservation. These population objectives were developed using historic, current, and anticipated future hunter demand. In the case of Kuiu Island, historic hunter demand from 1960 to 1968 was used, because Kuiu Island was closed to hunting from 1975 to 1992. To maintain a huntable population, the deer population objectives are 10 times higher than the estimated hunter demand.

The need to expend more time and greater hunter effort does not constitute a restriction to subsistence uses. Definitions of "significant restriction to subsistence uses" can be found on page 102, Chapter 3 of the North and East Kuiu FEIS. These definitions are provided by the Alaska Land Use Council and by the U. S. District Court in the Kunaknana v. Watt decision.

We do not believe that timber harvest and related activities in the Crane and Rowan Mountain project area will adversely affect customary and traditional practices of Kake subsistence users. Several project measures will lessen the potential impacts to areas typically used for subsistence. While we recognize that deer and other species require a full range of habitat, from saltwater to alpine areas, the Tongass Resource Use Cooperative Study and other data suggest that most subsistence activities on Kuiu Island occur parallel to the shoreline. Implementation of 1,000 foot beach and estuary buffer zones and 100 foot streamside buffers (for Class I streams and Class II streams that flow into Class I streams) will protect many of the areas important to subsistence users. The 1997 Forest Plan fish, wildlife and riparian standards and guidelines also include measures that will protect subsistence opportunities by maintaining fish and wildlife habitat productivity at the highest level possible. By protecting the most commonly used subsistence areas and minimizing fish and wildlife habitat loss, we believe that effects to customary and traditional subsistence practices will be minimal as a result of this project.

Sincerely,



CAROL J. JORGENSEN  
Assistant Forest Supervisor

Enclosure:  
Subsistence Specialist Report





## Organized Village of Kake

P.O. Box 316

Kake, Alaska 99830-0316

Telephone 907-785-6471

Fax 907-785-4902 / Email ovkgovt@seaknet.alaska.edu

(Federally Recognized Tribal Government serving the Kake, Alaska area)



March 30, 1998

RECEIVED  
APR 02 1998  
FOREST SERVICE

Everett Kissinger, Team Leader  
USFS Stikine Area  
PO Box 1328  
Petersburg, Alaska 99833

Re: OVK Comments on the Crane-Rowan Mountain Timber Sales DEIS

Dear Ms. Grantham:

The Organized Village of Kake (OVK) would like to thank you for having the scoping team come out to Kake for the Crane and Rowan Mountain Timber Sales. The Crane-Rowan Timber Sales look very familiar, these are the units that were either left out or negotiated out of the Alaska Wilderness Recreation and Tourism Association, et al. v. Morrison litigation, 67 F.3d 723, 729 (9<sup>th</sup> Cir. 1995) ("AWRTA"). OVK represents over 600 Tribal Members, and by our Constitution, the Council has to protect the welfare of the members and the grandchildren to come. OVK would like to make the following comments on the Draft Environmental Impact Statement (DEIS) for the Crane and Rowan Mountain Timber Sales.

A. OVK still feels the same way we have in the past and will continue to advocate for no more logging on Kupreanof and Kuiu Islands until we are assured that the habitat for fish and game (primary deer) are protected.

OVK prefers Alternative One, no action alternative. The main reason that OVK objects to any logging on Kuiu and Kupreanof Islands is that we are afraid of the **cumulative effects of logging on the habitat on both islands**. The EIS's of the individual timber sales, by the USFS, only address the effects of one logging sale at a time and not the past, present, and foreseeable timber sales and their cumulative effects of the habitat loss on fish and game. OVK objects to the statements that are used in the EIS about the proposed units of having a minimal effect on subsistence. OVK believes that wherever logging occurs, in any forest, especially on Kuiu and Kupreanof Islands, it has an effect on our way of life because of our reliance on deer and salmon for our food.

The native people of Kake do not need a computer model to tell us how logging so many acres of land will effect the population of deer. The people know that that we are currently harvesting the minimum harvestable deer now, and **not** the harvestable level that we should be gathering. Alaska Dept. of Fish & Game regulations permits a two deer harvest level, bucks only, on Kupreanof and Kuiu Islands and six deer harvest level on Admiralty Island. If a person hunts on Kuiu or Kupreanof Island, then they cannot hunt on Admiralty or Baranof Islands.

It is obvious that deer do not acknowledge a boundary established by computer models and especially any kind of unit boundary established on a map. Deer do not stay in one area on the island. Kake people know this, so the statement in the DEIS is false that the subsistence hunters do not use these areas to be logged, and that there will be no impact on subsistence. Everyone knows, or should, know that the deer use the whole island to exist. The DEIS fails to fully disclose and evaluate impacts on subsistence resources, violating NEPA and ANILCA.

**B.** The DEIS fails to adequately disclose and evaluate impacts on cultural resources, in violation of the National Historic Preservation Act (NHPA). Section 106 of the NGPA requires the USFS to perform an effect analysis on all historic resources, which meet informal criteria, not just those sites formally found to be eligible for listing in the National Register of Historic Places. According to the DEIS, there are a total of at least 107 potential heritage resource sites in the project area. DEIS 3-66, and 249 culturally modified trees (CMT) were found in four harvest units within the project area. DEIS 3-68. OVK relies on the Federal Regulations that require the USFS to “seek and consider the views of the public when taking steps to identify historic properties, evaluate effects, and develop alternatives.” 36 CFR 800.1 (c)(2)(iv). The USFS must disclose what public involvement was considered in evaluating the significance of the CMTs and their eligibility to the National Register. According to National Bulletin No. 38, a “traditional cultural property” is eligible for inclusion in the National Register if its association with cultural practices or beliefs of a living community that (a) are rooted in that community’s history, and (b) are important in maintaining the continuing cultural identity of the community.

Many of the Tlingit Clan members come from Kuiu Island and still maintain a direct connection to the island. The intimate knowledge of the clan members of Kuiu Island is still evident through the use of the island for hiking, camping, the gathering of Customary and Traditional Foods (subsistence), visiting the village sites, and sacred sites. This practice has been with the clan members since time immemorial, for thousands of years, whether we lived on Kuiu Island or here in Kake.

The USFS states, “[I]mplementation of a 1,000-foot beach fringe and estuary buffer zone effectively minimizes the probability of impacting heritage resources.” DEIS 3-69. This statement fails; however, to disclose and evaluate the impacts associated building roads within the beach fringe and estuary buffers, as well as past impacts due to management activities within these areas.

The USFS concludes that “[w]e determined that there are no historic properties (sites eligible to the National Register of Historic Places) within the area of potential effect for this project.” DEIS 3-69. The agency lacks a reasoned basis for this conclusion and violates the NHPA because it failed to evaluate and disclose the potential direct, indirect, and cumulative impacts on all sites which were ever potentially eligible for inclusion in the National Register in this DEIS.

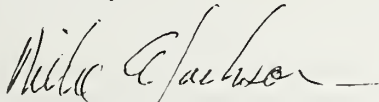
**C.** Other areas of concern that come up in the DEIS are the as follows:

1. Impacts of logging on Watersheds and Salmon Streams.
2. Continued USFS road building without a forest development road system plan for the Tongass.
3. How the USFS will disclose and evaluate the impacts of this timber sale on the U.S. Treasury.
4. Is the selection of the preferred alternative a violation of TTRA because it will offer timber in excess of likely market demand?

5. Is the spirit of the AWRTA case being followed?

**The alternative that OVK recommends is Alternative I, the No Action Alternative.** OVK maintains that the USFS **has to look at the cumulative effect** of past, present, and foreseeable logging on the habitat on fish and game. OVK depends on the Customary and Traditional Gathering (subsistence) for more than half of the food that we consume, so the logging has both economic and spiritual negative effects on OVK members.

Sincerely,

A handwritten signature in black ink, appearing to read "Mike A. Jackson", followed by a horizontal line.

Mike A. Jackson  
Realty and Trust Officer



File Code: 1950

Date: June 30, 1998

Mike A. Jackson  
Organized Village of Kake  
P.O. Box 316  
Kake, AK 99830-0316

Dear Mr. Jackson:

Thank you for your comments on the Draft Environmental Impact Statement for the Crane and Rowan Mountain Timber Sales. Your preference for Alternative 1, the no-action alternative is noted. This letter and a copy of your letter dated March 30, 1998, will be printed in Appendix C of the Final EIS. The following replies are in the same order as the comments in your letter.

With regard to your concern about the cumulative effects of logging, the FEIS includes effects analyses throughout Chapter 3. The cumulative effects of all past timber harvest, as well as the Rowan Settlement and the Saginaw Timber Sale, which are currently under contract but not yet logged, are discussed. Cumulative impacts to the island as a whole, however, will be considered as part of the planning process for any future timber sales on Kuiu Island.

We do not believe that timber harvest and related activities in the Crane and Rowan Mountain project area will adversely affect customary and traditional practices of Kake subsistence users. Several project measures will lessen the potential impacts to areas typically used for subsistence. While we recognize that deer and other species use a full range of habitat, from saltwater to alpine areas, the Tongass Resource Use Cooperative Survey and other data suggest that most subsistence activities on Kuiu Island occur parallel to the shoreline. Implementation of 1,000 foot beach and estuary buffer zones and 100 foot streamside buffers (for Class I streams and Class II streams that flow into Class I streams) will protect many of the areas important to subsistence users. The fish, wildlife and riparian standards and guidelines in the 1997 Forest Plan also include measures that will protect subsistence opportunities by maintaining fish and wildlife habitat productivity at the highest level possible. By protecting the most commonly used subsistence areas and minimizing fish and wildlife habitat loss, we believe that effects to customary and traditional subsistence practices will be minimal as a result of this project. To better address subsistence concerns, we have modified and expanded the subsistence section in the Final EIS.

Your comment relative to the deer hunting regulations appears to be incorrect. The Alaska Department of Fish and Game regulations prohibit deer hunting on Kuiu or Kupreanof Islands if two deer were previously harvested elsewhere (like on Admiralty Island). However, the first two deer may be harvested in Game Unit 3 (Kuiu, Kupreanof, and Mitkof Islands) and further harvest allowed from another unit that allows a greater deer harvest (for example, Prince of Wales, Admiralty or Baranof Islands).

We considered the effects to all heritage resource sites in the project area that are eligible for inclusion in the National Register of Historic Places. We considered all potential direct, indirect and cumulative impacts and we determined that no eligible sites would be affected. The Alaska State Historic Preservation Officer concurred with that determination. With the exception of some of the 249 recorded culturally modified trees, none of the known study area sites, including those not eligible to the National Register, will be adversely affected by the proposed timber sale. Culturally modified trees are not recognized as heritage sites by The Alaska Office of History and Archaeology, nor do they meet the eligibility criteria for the National Register of Historic Places. The DEIS provides a summary of our study of heritage resources in the project area. A more detailed report was prepared and submitted to the Alaska State Historic Preservation Officer.

Eliciting the views of the public for the Crane Rowan Mountain DEIS is an appropriate method of public involvement for the Section 106 process. We recognize the cultural importance of Kuiu Island to the Tlingit people. We have not, however, received information on culturally modified trees that would result in a determination that they are eligible for inclusion in the National Register.

Archaeological survey data compiled over the last 20 years clearly demonstrates that most heritage sites are located a short distance from the coastline. One thousand foot beach fringe and estuary buffer zones effectively minimize the probability of impacting these heritage resources. No roads are planned to be constructed in the buffer zones as a result of the proposed timber sale.

With regard to the other areas of concern in your letter:

1. Impacts of logging on watersheds and salmon streams are discussed on pages 3-29 through 3-38, and 3-57 through 3-59 in the DEIS. The Dean Creek and Security Creek Watershed Analyses, and the Fisheries Specialist Report provide further discussion and are located in the planning record at the Petersburg Ranger District.
2. The Forest Service maintains a Forest Development Transportation Plan in accordance with direction found in Forest Service Manual 7711. This plan is the official description of the forest development transportation system and consists of a series of base maps showing the location of each facility and an inventory record defining their characteristics. These documents also serve as the forest development road system plan referenced in the National Forest Management Act. The key point is that this plan is a description of existing permanent roads.
3. National Forests are managed for a variety of uses, one of them being timber production. National Forests are not necessarily managed to give the greatest dollar return to the Treasury. The actual return to the Treasury will not be known until these sales are sold under the competitive bid process. It is not possible to give the exact cost to prepare and administer the Crane and Rowan Mountain Timber Sales as each sale is different depending on size, location, timber quality, etc. The latest figures we have for average Stikine Area costs are \$41 per mbf (thousand board feet) for planning and NEPA analysis; \$23 per mbf for sale preparation and offering; \$9 per mbf for sale administration; and \$28 per mbf for engineering and road design.
4. As in the rest of the world, timber demand in Southeast Alaska varies dramatically on an annual basis. Periodic shortages or surpluses of timber to meet market demand does not constitute a violation of TTRA. The level of demand is difficult for the Forest Service and timber industries to predict with any precision. Demand is not a single number. It is influenced by complex

interactions that include interest rates, housing starts, value of the dollar, changes in export policies, and business cycles. The Brooks and Haynes figures are based on global demand and minor changes in assumptions could mean large-scale differences in demand for Alaskan timber products.

In order to meet market demand the Forest Service needs to maintain a stable timber sales program. It takes approximately three years to progress through the NEPA process and sale preparation. The Stikine Area has sold all recent timber sales that have been advertised at or above appraised rates, indicating that the supply for National Forest timber has not exceeded demand.

Appendix A of the DEIS, which discusses market demand and timber harvest scheduling, has been revised and is now located in the planning record.

5. Three meetings were held in Kake as directed by the AWRTA v. Morrison settlement to discuss management of Kuiu Island including the Crane and Rowan Mountain Timber Sales. These meetings were held May 21, June 11, and August 2, 1996. The report on the workshops is available in the planning record for this timber sale as well as in the public record for the Tongass Forest Plan revision. It will be referenced in the FEIS.

The AWRTA settlement agreement states on page two and three that some of the units in the Crane and Rowan Mountain sale area "will remain subject to injunction pending compliance with NEPA and ANILCA section 810." The Crane and Rowan Mountain Timber Sales EIS is the instrument to meet these requirements.

Following the spirit of the AWRTA settlement and our recent meetings with the Organized Village of Kake Council, I would be pleased to continue the government to government dialog we have established and meet with the Council to further discuss your concerns.

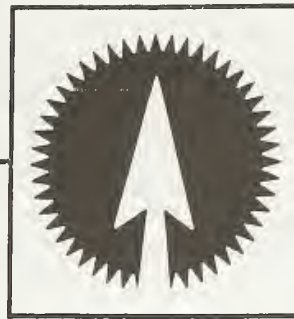
Sincerely,



CAROL J. JORGENSEN  
Assistant Forest Supervisor

*P.S. Mike, Everett was telling me of some of the ideas and issues you shared when the team met with OVK Council, and we are making sure we follow up on them, also to listen to the information our people have regarding deer harvesting.*

*I look forward to seeing you on the 15th.*  
*Carol J.*



111 STEDMAN SUITE 200  
KETCHIKAN, ALASKA 99901-6599  
Phone 907-225-6114  
FAX 907-225-5920

March 30, 1998

Everett Kissinger, Team Leader  
USDA Forest Service  
PO Box 1328  
Petersburg, AK 99833

**Re: Crane and Rowan Mountain Timber Sales DEIS**

Dear Mr. Kissinger:

The Alaska Forest Association (AFA) has reviewed the December 1997, Draft Environmental Impact Statement for the Crane and Rowan Mountain Timber Sales project, Tongass National Forest. AFA has more than 100 members and 200 associate members throughout Alaska. AFA, its members, their employees and the timber dependent communities of Southeast Alaska depend on the Forest Service (FS) to provide economic timber sales of sufficient volume to meet the needs of the Southeast Alaska timber industry.

**Timber volume from the Crane and Rowan DEIS is needed to meet market demand**

AFA fully supports the Crane and Rowan Mountain Timber Sales project. The timber in this project was part of the approximately 200 MMBF which was subjected to supplemental NEPA work due to the settlement agreement in *Alaska Wilderness Recreation and Tourism Association v. Morrison (AWRTA)*. The FS is to be commended for producing a supplemental EIS on this volume in a timely manner, and attempting to put the Crane and Rowan volume back on the street. Given the current lack of pipeline volume and the shortfall of available timber relative to installed mill capacity, Crane and Rowan timber is extremely important to the timber industry in Southeast Alaska.

**NEPA analysis in Crane & Rowan DEIS is adequate**

The Crane and Rowan DEIS represents adequate supplemental NEPA analysis on this project

area, especially given the fact that this same timber has already been through substantial analysis under NEPA. Mitigation measures and other multiple use considerations in all alternatives considered in the DEIS meet the new TLMP requirements. However, a more economically viable plan could be offered by the FS as outlined in these comments.

AFA urges the FS to adopt Alternative 2 as the preferred alternative in the Crane and Rowan FEIS. The preferred alternative identified in the DEIS (Alt. 4) relies too heavily on diameter limit harvest units, which will have ramifications for both silviculture and sale economics. Another approach would be for the FS to modify Alternative 4 by prescribing the clearcut method for some units. For example, the units at Crane Mountain (420-46, 47, 48) and the units at West Fork Kadake (421-49, 50, 51) should be harvested using the clearcut method.

### **The Tongass timber sale program economics are fundamentally flawed**

AFA believes that before the FS can stabilize its timber sale program and meet the needs of the timber industry in Southeast Alaska, it needs to re-evaluate its timber demand analysis. The FS interpretation of market demand is leading to insufficient and uneconomical timber sales, creating a program which is at cross purposes with the agency's often stated goal of encouraging the growth of a reconfigured timber industry in Region 10.

1. While the FS program reflects an attempt to address the volume needs of the diminishing timber industry in Alaska, the FS continues to underestimate the market demand for timber products sold from the Tongass National Forest. The inadequate volume of timber available from the Tongass, the lack of consideration for economics in timber sale design, and the uncertainty of supply are serious impediments to sustaining a viable forest products industry in Southeast Alaska.
2. The demand analysis in the Tongass Land Management Plan (TLMP) FEIS, Appendix M, does not consider important factors that contribute to the demand for Tongass timber. The draft 1997 Brooks and Haynes study on which TLMP depends, including the later final version of that report relied upon by the Crane and Rowan DEIS, both ignore the

following significant factors affecting timber demand projections for the next 10 years  
(See DEIS, Appendix A, p. 2 - 3):

- A new mill on Gravina Island owned and operated by Seley Log and Lumber;
- The proposed Sealaska/Louisiana Pacific JV which is intended to operate a veneer plant at Ward Cove and sawmills on Revillagigedo and Annette Islands;
- The purchase and re-opening of the old APC facility in Wrangell by Silver Bay Logging, which will include a small log sawmill and a merchandising yard; and
- Changing markets in Japan which include a shift away from heavy dependence on round log imports, and an increased demand for lumber and manufactured wood products which could be produced in Alaska.

3. The FS should not only acknowledge the importance of a predictable timber sale program in maintaining a viable forest products industry in Southeast Alaska, it should also consider the impact an unstable and unpredictable supply has on the timber industry. The lack of a stable timber supply, including the absence of sufficient volume under contract (pipeline volume), is hindering the investments necessary for the industry to remain competitive in the world marketplace (See DEIS, Appendix A, p. 1-5)
4. The FS should concentrate on the timber supply side of the supply/demand equation and leave the demand side of the equation to those who will be making the investments. When the FS offers economically viable timber sales, the timber industry will be able to manufacture products to meet market demand which, in turn, will revitalize the Southeast Alaska economy.
5. The FS should provide the maximum environmentally feasible and economically harvestable volume from each NEPA project. This will help create an economic climate

in which new investments can be made to build a new forest products industry infrastructure in Southeast Alaska. The FS should remember that after the closure of the pulp mills, it made a commitment to support and encourage a new primary and secondary manufacturing industry. Among other occasions, the FS made this commitment publically in the context of meetings of the Governor's Timber Task Force in the autumn and winter of 1996.

### **The FS could offer a more economically viable Crane and Rowan timber sale**

1. It is unclear whether the Crane and Rowan DEIS takes into account the falldown in harvestable volume that may occur from on-the-ground application of the new TLMP Standards and Guidelines (S&Gs), especially for marten, goshawk and endemic mammals. AFA calculates that the impact of the S&Gs, when applied on a unit by unit basis, could run as high as 25 percent. Therefore, the volumes given for each alternative must be treated as estimates, and this will have an effect on sale economics.
2. Three of the five alternatives, including the FS preferred alternative, utilize alternatives to clearcutting (ATC). Since clearcutting is the preferred silvicultural prescription for Southeast Alaska, an alternative which maximizes clearcutting (such as Alternative 2) should be chosen. Such an alternative would provide improved economics.
3. Since the economic and environmental effects of various ATCs have not been documented by scientific data, the use of ATCs should be limited until such data are compiled. The FS should prepare and present a detailed monitoring plan that can be used for planning future timber sale projects. At a minimum, the monitoring plan should include analysis of residual damage, regeneration of various indigenous species, stand quality, recurrence of dwarf mistletoe, susceptibility to wind throw, and the effect on sale economics. The Crane and Rowan Mountain Timber Sales DEIS does not include details for such a plan.

4. Harvestable volume proposed by the FS in the four action alternatives ranges from 17.8 MMBF to 24 MMBF. Unlike Prince of Wales Island which has many small resident timber processing facilities along its extensive road system, Kuiu Island is essentially uninhabited and remote. Given this remoteness, the FS should offer sales with sufficient volume to amortize mobilization costs and provide sufficient economic return. Specifically, AFA believes the FS should adopt Alternative 2 or a modified version of Alternative 4 (see above) and offer all units in a single sale.

The Alaska Forest Association appreciates the opportunity to participate in the planning of the Crane and Rowan Timber Sales project. Please contact me at (907) 225-6114 if you have any questions concerning the above comments.

Sincerely,



Jack E. Phelps  
Executive Director

JEP/ram



File Code: 1950

Date: June 30, 1998

Jack E. Phelps  
Alaska Forest Association, Inc.  
111 Stedman, Suite 200  
Ketchikan, AK 99901-6599

Dear Mr. Phelps:

Thank you for your comments on the Draft Environmental Impact Statement for the Crane and Rowan Mountain Timber Sales. This letter and a copy of your letter dated March 30, 1998, will be printed in Appendix C of the Final EIS. The following replies are in a similar order as the comments in your letter.

***Timber volume from the Crane and Rowan DEIS is needed to meet market demand.***

We appreciate the Alaska Forest Association's support for this project. We realize the importance of a reliable supply of timber available to the industry. The Crane and Rowan Mountain Timber Sales are part of a Tongass-wide effort to meet this market demand.

***NEPA analysis in Crane & Rowan DEIS is adequate.***

Your preference for Alternative 2 is noted. The silvicultural and economic ramifications of the diameter limit harvest are not well known. However, since much of the small and low quality trees would remain on site, we think sale economics would be better than with clearcut methods where helicopter logging is required.

***The Tongass timber sale program economics are fundamentally flawed.***

Your comments on timber sale economics have been noted.

***The FS could offer a more economically viable Crane and Rowan Timber Sale.***

The Crane and Rowan Mountain DEIS incorporated all 1997 Forest Plan standards and guidelines and best management practices for the protection of forest resources. Since all units have been intensively field verified, we expect little or no additional reduction in volume from the application of standards and guidelines.



A monitoring plan is included in the Crane and Rowan Mountain Timber Sales DEIS on pages 2-19 through 2-22. A more detailed monitoring plan will be developed later.

Kuiu Island is remote and the cost of mobilization of equipment is expensive. The Forest Service will consider this information if an action alternative is selected.

Sincerely,

A handwritten signature in cursive script that reads "Carol J. Jorgensen".

CAROL J. JORGENSEN  
Assistant Forest Supervisor



# FOREST GUARDIANS



March 30, 1998

Everett Kissinger  
Petersburg Ranger District  
Tongass National Forest  
P.O. Box 1328  
Petersburg, Alaska 99833  
FAX: (907) 772-5995

RECEIVED  
APR 6 1998  
FOREST SERVICE

Dear Mr. Kissinger,

Forest Guardians is a non-profit corporation with its principal office in Santa Fe, New Mexico. Our mission is to protect and restore the native biological diversity of forests throughout the U.S., including forests in the Crane & Rowan Mountain Timber Sale area. Forest Guardians has approximately 2,000 individual and business members throughout the U.S. Many of our members use and enjoy the ecological resources of the Crane & Rowan Mountain Timber Sale area on a regular basis for recreational, aesthetic, and scientific activities. In pursuit of these activities, Forest Guardians regularly observe and enjoy the wildlife, clean water, and unmanaged forests of the Crane & Rowan Mountain Timber Sale area.

We are concerned with the adverse economic effects of the national forest logging program, and the Forest Service's failure to quantify such effects at the project level or for the program as a whole. The logging program increases costs of water purification and filtration, decreases the value of private timberlands, unfairly competes against alternative fiber and building material businesses, increases wildfire risk, increases repair and maintenance costs for highways and public roads, and decreases the number of jobs in recreation, tourism, fisheries, and alternative forest products.

In addition, the ecosystem service values of standing forests, especially native forests, including their value in providing clean water, mitigating floods, supporting recreation, hunting, fishing, and wildlife viewing, enhancing long term forest productivity, supplying alternative forest products, mitigating global warming and controlling agricultural pests are systematically undervalued or not valued at all. For example, the Forest Service typically assigns zero economic value to "no action" alternatives in timber sale E.A.s or E.I.S.s, or no value at all.

The federal government has, in its possession, tools of economic analysis that enable project planners to estimate both adverse economic impacts as well as ecosystem values, and incorporate these estimates into E.A.s or E.I.S.s so that realistic comparisons between

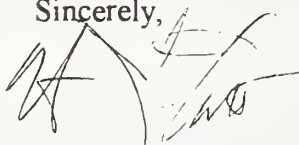
economic benefits of the various alternatives can be completed. Incorporation of such costs and benefits is essential to fulfill the Forest Service's primary duty in management of Forest Service lands, namely, to maximize net public benefits.

To adequately quantify costs associated with the Crane & Rowan Mountain Timber Sale, as well as the economic values of unlogged forests in the Crane & Rowan Mountain Timber Sale area, the Forest Service must adopt analysis techniques, such as the Natural Resources Damage Assessment techniques the federal government already applies in the context of oil spill litigation. We specifically request that the adverse external economic costs of logging in the Crane & Rowan Mountain Timber Sale area, as well as ecosystem service values of standing forests be estimated in the final E.A. (or EIS) for the Crane & Rowan Mountain Timber Sale area project using the latest quantitative techniques available.

Finally, the opportunity costs of the logging program, which include the value of uses forgone on areas logged plus the benefits associated with alternative uses of timber sale funds have not been evaluated on a project basis or for the logging program as a whole. In the final E.A. (or EIS) for the Crane & Rowan Mountain Timber Sale, the Forest Service must analyze alternative uses of the funds to be spent on this timber sale, to determine whether or not net public benefits can be maximized in other ways. We specifically request consideration of an alternative that would utilize available funds for this project to support the ecological restoration component of this sale by itself, without completing the commercial sale component. Such an alternative will improve ecological conditions, and leave the economic values of unlogged forests in the area intact. Such an alternative would most likely maximize net public benefits in the Crane & Rowan Mountain Timber Sale area.

Please keep Forest Guardians on the mailing list to receive copies of the final decision notice and E.A. (or E.I.S) for the Crane & Rowan Mountain Timber Sale project.

Sincerely,

A handwritten signature in dark ink, appearing to read 'John Talberth', is written over a horizontal line.

John Talberth  
Executive Director



File Code: 1950

Date: June 30, 1998

John Talberth  
Forest Guardians  
1413 Second Street, Suite One  
Santa Fe, NM 87505

Dear Mr. Talberth:

Thank you for your comments on the Draft Environmental Impact Statement for the Crane and Rowan Mountain Timber Sales. This letter and a copy of your letter dated March 30, 1998, will be printed in Appendix C of the Final EIS. The following replies are in the same order as the comments in your letter.

Many of your generalized concerns about logging as a whole do not apply to the Crane and Rowan Mountain project area, located on Kuiu Island in Southeast Alaska. The project area receives in excess of 100 inches of precipitation each year. The threat of wildfire is extremely low and is generally not a concern in this maritime climate. Kuiu Island is accessible only by boat, floatplane, or helicopter. There are no permanent communities, no ferry service to the island, and consequently very little traffic. All roads on the island are public roads constructed and maintained solely for silvicultural purposes. Roads are maintained at low levels through timber sale contracts.

It is not substantiated that timber sales decrease employment in Southeast Alaska in the recreation, tourism, and fishing industries. Roads are very limited in Southeast Alaska, and in some instances, have made access to remote areas more affordable for visitors. The Tongass Land Management Plan Revision, Final EIS (Part 1, pages 3-100 to 3-147, 1997) provides a discussion on the environmental consequences of implementing management direction on recreation and tourism.

In your letter, you request an economic analysis to estimate the costs and benefits of logging, and the service values of standing forests. These types of analyses are best conducted on a forest-wide basis, rather than for each sale. The Tongass Land Management Plan Revision, Final EIS (Part 2, Chapter 3, 1997) presents a thorough discussion of the effects of implementing management direction on the economic and social environment. The Crane and Rowan Mountain Timber Sales are consistent with and tier to the 1997 Forest Plan.

Alternative 1 is an alternative that supports ecological restoration by implementing no timber harvest or road construction activity from this proposed action. Forest Service funding regulations do not permit dollars appropriated by Congress for one activity to be re-allocated to implement another activity. For instance, dollars allocated by Congress to be spent to perform recreation maintenance in a Wilderness can not be spent on cabin maintenance in a non-wilderness area. Further, funding appropriated by Congress for commercial timber sales can not be re-appropriated for ecological restoration.



There are several avenues available for funding ecological restoration and resource improvement projects. One way is with Knutson-Vanderberg (KV) funds. KV funds are collected from timber sale receipts and are spent within the project area to perform numerous kinds of ecological improvements. During the preparation of a timber sale, Forest Service employees develop a KV Plan based on resource needs. Resource improvement projects include reforestation; constructing fish passage structures; thinning trees to enhance growth; seeding and fertilizing grass to prevent erosion; and habitat improvement for wildlife, fisheries and rare plants. Ecological restoration projects in the Crane and Rowan Mountain study area that are funded and underway are the Kadake Creek Watershed Enhancement Project and the Rowan Bay Road Closure Project.

Sincerely,

A handwritten signature in cursive script that reads "Carol J. Jorgensen".

CAROL J. JORGENSEN  
Assistant Forest Supervisor



UNITED STATES DEPARTMENT OF COMMERCE  
Office of the Under Secretary for  
Oceans and Atmosphere  
Washington, D.C. 20230

February 9, 1998

Everett Kissinger  
Team Laeder, USDA Forest Service  
PO Box 1328  
Petersburg, AK 99833

FEB 23 1998

1998 FEB 23 11:51

Dear Mr. Kissinger:

Enclosed are comments on the Draft Environmental Impact Statement for Crane and Rowan Mountain Timber Sales Petersburg, Alaska. We hope our comments will assist you. Thank you for giving us an opportunity to review this document.

Sincerely,

*Susan B. Fruchter*

Susan B. Fruchter  
Acting NEPA Coordinator

Enclosure



MEMORANDUM FOR: Susan B. Fruchter  
Acting NEPA Coordinator

FROM: Charles W. Challstrom  
Acting Director, National Geodetic Survey

SUBJECT: DEIS-9802-02-Crane and Rowan Mountain Timber Sales  
Petersburg, Alaska

The subject statement has been reviewed within the areas of the National Geodetic Survey's (NGS) responsibility and expertise and in terms of the impact of the proposed actions on NGS activities and projects.

All available geodetic control information about horizontal and vertical geodetic control monuments in the subject area is contained on the NGS home page at the following Internet World Wide Web address: <http://www.ngs.noaa.gov>. After entering the NGS home page, please access the topic "Products and Services" and then access the menu item "Data Sheet." This menu item will allow you to directly access geodetic control monument information from the NGS data base for the subject area project. This information should be reviewed for identifying the location and designation of any geodetic control monuments that may be affected by the proposed project.

If there are any planned activities which will disturb or destroy these monuments, NGS requires not less than 90 days' notification in advance of such activities in order to plan for their relocation. NGS recommends that funding for this project includes the cost of any relocation(s) required.

For further information about these monuments, please contact Rick Yorczyk; SSMC3, NOAA, N/NGS; 1315 East West Highway; Silver Spring, Maryland 20910; telephone: 301-713-3230 x142; fax: 301-713-4175.



United States  
Department of  
Agriculture

Forest  
Service

Alaska Region

Tongass National Forest  
Petersburg Ranger District  
P. O. Box 1328  
Petersburg, AK 99833

File Code: 1950

Date: March 3, 1998

Susan B. Fruchter  
US Dept. of Commerce, NOAA  
5805 HCHB  
14th and Constitution Ave. NW  
Washington D.C. 20230-0001

Dear Ms. Fruchter:

Thank you for your comments on the Draft Environmental Impact Statement for the Crane and Rowan Mountain Timber Sale. You expressed a concern that the project may affect geodetic control monuments in the area.

Sam Bunge, our Land Surveyor and Geometronics Coordinator, reviewed the Crane and Rowan Mountain sale planning maps, and determined that there are no logging activities planned in any location where National Geodetic Survey control monuments would be disturbed. All NGS control monuments are located on the shoreline, and there are no activities in the Crane and Rowan Mountain Timber Sale near any marine shoreline.

Sincerely,

ROBERT DALRYMPLE  
Acting District Ranger

980226prd1950\_LPT





# *Silver Bay Logging, Inc.*

Cube Cove #2

Juneau, Alaska 99850-0360

(907) 586-4133

(907) 586-5686

(907) 799-2211

FAX 799-2212

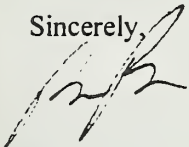
March 12, 1998

Everett Kissinger,  
Team Leader, USDA Forest Service  
PO Box 1328  
Petersburg, AK 99833

Dear Mr. Kissinger,

We concur with the choice of alternative 4 for the Rowan and Crane settlement EIS. We would prefer to see more timber being harvested in this area but the choice of alternatives was rather meager. Kuiu Island has supported timber harvest for the past 30 years and even-aged management systems are the best for this area as past evidence supports.

Sincerely,



Brian Brown  
Silver Bay Logging



File Code: 1950

Date: March 17, 1998

Brian Brown  
Silver Bay Logging  
Cube Cove #2  
Juneau, AK 99850-0360

Dear Mr. Brown:

Thank you for your letter of March 12 commenting on the Draft EIS for the Crane and Rowan Mountain Timber Sales. We have noted your preference for Alternative #4 and for the use of even-aged management systems.

Should you have any additional comments or questions, please don't hesitate to contact Everett Kissinger at (907)772-3841.

Sincerely,

PATRICIA A. GRANTHAM  
District Ranger





USDA Forest Service  
Stikine Area, Tongass National Forest  
P.O. Box 309  
Petersburg, AK 99833

OFFICIAL BUSINESS  
PENALTY FOR PRIVATE USE, \$300

---

PRIORITY MAIL  
POSTAGE & FEES PAID  
USDA F. S. /JUNEAU, AK  
PERMIT NO. G-40

---